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DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS

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Among 105 patients hospitalized for spontaneous vertebral compression fractures, there were 55 (9 men and 46 women) in whom the diagnosis of osteoporosis was accepted after the exclusion of all other known causes of such fractures. Back pain was the chief symptom listed by all patients, but it was not always concurrent with the fracture. A history of cholecystectomy, hysterectomy, and a diet low in calcium content was common to one-third of the women. The condition was not limited to postmenopausal patients. No biochemical or roentgenographic evidence of benefit was noted in any of the patients receiving hormone therapy, but more than half said they felt better while taking hormones. Bed rest with gradual return to normal activity was adequate treatment in many cases, but about one-third of the patients required absolute bed rest for six weeks. Ten patients failed to improve and went on to a series of relapses and hospitalizations.

OSTEOPOROSIS is a disease which produces a quantitative decrease, but not qualitative histological change, in bone. The effects of this disease are among the chief contributory causes of a variety of fractures and subsequent crippling deformities. In the older population especially this disease is one of the important causes of long-term illness, with its concomitant pain, suffering, and prohibitive expense.

Although there are 800 or more cases of osteoporosis reported in the literature,[1] there are few which have had comprehensive long-term follow-up reported by orthopedic surgeons. This paper reports the characteristic features of 55 additional patients with osteoporosis, their treatment, and follow-up data on them.

In a recent study[2] of 105 patients admitted to the Hospital for Special Surgery between 1950 and 1958 with spontaneous vertebral compression fractures, we found a variety of diseases other than osteoporosis which produced rarefaction of bone with severe pain requiring hospitalization (table 1). Osteoporosis was a diagnosis arrived at only by careful exclusion of such conditions. Serum chemistry studies, direct bone biopsy, and marrow examination were repeatedly the most fruitful aids in differentiating other bone disorders from osteo-

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porosis. In another report [3] the authors noted that studies of 24-hour urine calcium excretion, with use of Knapp's formulation,[4] were also of value in establishing the differential diagnosis of rarefying bone disease.

TABLE 1.—*Established Diagnosis in 105 Patients with Spontaneous Vertebral Collapse*

Diagnosis	Patients, No.
Osteoporosis	55
Idiopathic osteoporosis	4
Postmenopausal and senile osteoporosis	51
Malignancy	25
Metastatic carcinoma	12
Multiple myeloma	9
Other	4
Hyperadrenalism, with rheumatoid arthritis	9
Osteomalacia (malabsorption)	6
Polycythemia vera	3
Hyperparathyroidism	2
Other	5

Analysis of Age, Sex, and Number of Vertebral Fractures

The 55 patients suffering from osteoporosis constituted more than half of the 105 patients admitted with spontaneous vertebral collapse to the hospital between 1950 and 1958. There were 9 men and 46 women who received the diagnosis of osteoporosis. The age incidence of this group of patients is depicted in table 2. Data from 57 other patients who had adequate trauma or known malignancy with fractures were discarded from this study. Spontaneous vertebral compression was a prerequisite for the roentgenologic diagnosis of osteoporosis, although other criteria such as "increased vertical trabecular systems," "pencil cortices," and "cod-fishing" were usually present.

After exacting examination only 5 of 27 patients under the age of 55 years were given a diagnosis of osteoporosis. Of 78 patients over the age of 55 years, 50 were found to have osteoporosis.

Although most patients with osteoporosis in this series were between 55 and 75 years of age, the youngest patient was a man, 38 years of age, who had four vertebral compression fractures. Three marrow studies performed on him as well as two direct biopsies gave negative results. Repeated examination was completely unremarkable and the patient was diagnosed as suffering from idiopathic osteoporosis. One woman aged 44 (whose repeated examination gave a negative result) had severe osteoporosis, with six vertebral bodies fractured. Her history revealed that her menopause was induced by hysterectomy and oophorectomy for endometriosis at 29 years of age. There were three other patients with osteoporosis under 55 years of age, all women, two of whom were aged 49 and one of whom was aged 52 years.

It was also observed that, when the number of vertebral bodies fractured in a given patient was counted, there was usually a significant difference between the number of collapsed vertebrae in patients with osteoporosis and those in patients with primary or secondary malignant bone disease. Thus, of 16 patients in whom a diagnosis of bone malignancy was established after examination, 14 had no more than two vertebrae fractured. Only 10 of 55 patients with osteoporosis had one or two vertebrae fractured. Metabolic bone disease, osteomalacia, and osteoporosis were usually characterized by a multiplicity in the number of vertebral bodies fractured, whereas malignancy, with the exception of multiple myeloma, tended to produce one or two vertebral fractures. Of nine patients with multiple myeloma two had 10 or more collapsed vertebrae; three patients had one vertebral collapse; and the other four patients had between 3 and 6 collapsed vertebrae.

Other Locales of Fractures.—Six patients each had three or more other skeletal fractures after the age of 50 years. One patient had broken both wrists, one hip, and two humeral heads in the past. In some, however, there were no other fractures. Since spontaneous fractures are rare in long bones unless they are due to malignancy or osteomalacia, other sites of fracture were not used as a criterion in this study.

Other Case Data

Duration of Symptoms.—The nature and occurrence of symptoms varied. Pain was often acute, sometimes chronic or exacerbating, and at times absent. All of the patients, however, were admitted with acute, severe back pain and spasm. Of the 55 patients 47 had had backache of intermittent degree and intensity for some time prior to their present hospitalization; in 8 it had been for only one week prior to admission, 16 had had backache for from one week to six months, 4 for six months to one year, 21 for one to five years, and 6 for over five years.

In the younger patients, backache was more apt to be of sudden onset, without any prior history. In general, the older the patient, the longer the history of backache. Indeed, one patient complained of having had back pain for 30 years and insisted that, at the time of admission for new collapse, the pain was of the same type and in the same region as it had been throughout the years,

TABLE 2.—*Age Incidence of Fifty-five Patients with Osteoporosis*

Age, Yr.	Patients, No.
36-45	2
46-55	3
56-65	32
66-75	13
Over 75	5

except that it was of greater intensity. Three patients had intermittent backache of over 20 years' duration, and in these patients there were multiple vertebral fractures. However, none of the obvious old collapsed vertebral bodies apparently produced pain of sufficient intensity to warrant hospitalization until the present episode. Although there was no

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significant relationship noted between the onset of clinically discernible osteoporosis and the first appearance of backache, eight patients had their first history of back pain associated with a fresh vertebral collapse. In general, it can be said that the cause of pain in such patients is often obscure. Pain is present without evidence of further collapse and may be due to microfractures, but this is difficult to prove.

Relation of the Menopause to Disease.—There were 46 women in this series. Their menstrual history is shown in table 3.

One patient had primary amenorrhea, with severe multiple compression fractures. Three other women whose periods were still present had considerable osteoporosis. One must assume, therefore, that in these patients, in whom no other cause for this striking demineralization could be found, the osteoporosis should not be labeled the postmenopausal variety. However, in this series, 21 women had periods which terminated prior to the age of 45 years. In most, clinical symptoms suggesting the onset of the menopause were found by the age of

TABLE 3.—*Age at Cessation of Menses of Forty-six Women with Osteoporosis*

Age, Yr.	Patients, No.	Menopause Induced by Hysterectomy or Oophorectomy
Never had a period	1	...
Still present	3	...
Under 35	4	3
36-40	4	3
41-45	13	4
46-50	9	3
51-55	10	1
Over 55	2	...
Total	46	14

40 years. Eight women had cessation of menses prior to the age of 40, six by hysterectomy or oophorectomy.

Since there were nine men in this series, as well as three premenopausal women and one woman who had never had periods, it can be seen that over 20% of the patients had osteoporosis which could not be related to changes associated with the menopause. This should furnish ample evidence for the obscure pathogenesis of this disease and emphasize the fallacy of ascribing it solely to the menopause.

Relationship of Gastrointestinal Disease and Calcium Intake in Patients with Osteoporosis.—Our dietitians determined the average calcium intake of the patients at the time they were admitted. It was estimated that 18 patients had an average of less than 500 mg. of calcium intake per day—a low figure, which was explained by the fact that none of these patients drank any milk. Twenty-two patients had an average intake of between 500 and 800 mg. of calcium a day, and 15 patients had an average of over 800 mg. of calcium intake per day.

The patients were questioned and examined for the presence of gastrointestinal tract disease. Of the 46 women, 22 had a history of biliary tract or gastrointestinal disease which required medical treatment prior to admission. Of the nine men, one had a history of previous ulcer. These patients, however, did not have any evidence of osteomalacia.

Of interest was the fact that twelve women who had had prior cholecystectomy had also undergone hysterectomy. Only one of these women had an average calcium intake exceeding 700 mg. a day. Perhaps a reason for accelerated net calcium loss was that most patients had cut down their milk intake because of fatty food intolerance. Thus, 25% of the women in this series had low calcium intake, had had induced menopause, and had had cholecystectomy.

Marrow, Biopsy, and Laboratory Data.—Thirty-four marrow examinations were performed on 26 patients with osteoporosis. All gave negative results. Direct bone biopsy of lytic lesions, with 11 negative results, was done in 9 patients with osteoporosis. In the over-all series of 105 patients, there were 13 positive results of marrow examinations in 48 patients. One realizes, then, that this is an integral part of a complete examination and is especially helpful in the diagnosis of conditions which may be mistaken for osteoporosis. In the osteoporotic patients no unusual laboratory values were found, with the exception of transient hypercalcemia in a patient in whom repeat studies gave normal results.

Treatment

Management of Back Pain and Fractures.—Treatment of osteoporotic patients was directed to the management of their compressed vertebrae during the acute and convalescent phases, and the long-term efforts were directed to reducing the possibilities of a negative mineral balance.

Plaster of paris casts were not used in this series except in two patients in whom attempts were made to reduce the fracture. Otherwise, compression was accepted but the spine was kept from flexing by not allowing the patient to sit up for two to four or more weeks. On hospitalization, with acute pain, the patients were sedated and kept on strict bed rest as long as was necessary to relieve pain. Some were kept on oscillating beds, but this had no visible effect on the patients' convalescence. Table 4 shows the number of days of strict bed rest these patients required in the hospital prior to their discharge.

Of 55 patients 20 required bed rest for more than four weeks, and 18 were hospitalized for six or more weeks. It was apparent that, in many cases, allowing the patient to sit up, to walk, or to go to the bathroom too soon exacerbated the symptoms. Such setbacks were frequent and troublesome and associated with the minutest of strains.

Supports and Physical Therapy: In two patients body spicas were used for three months; 28 patients were fitted with corsets; and 25 patients had various types of braces provided for them when they were allowed to walk. A few of the patients noted that they felt the need for intermittent use of supports for up to six or seven years, but in most cases supports were discarded in six months. Careful fitting usually rendered supports, at first uncomfortable, symptomatically helpful.

Diathermy and other forms of heat therapy, although frequently used, did not seem to play any role in accelerating symptomatic recovery. In some cases heat was definitely thought to increase pain. Occasionally, warm, moist packs were of symptomatic value in the early phase of treatment.

Complications: Severe exacerbations occurred in 12 of the 55 patients within six months, requiring their readmission. A number of complications occurred, in addition to the deformity which resulted from increased shortening. The significant complications included cystitis (eight patients), vomiting secondary to ileus (seven patients, one of whom died), renal calculi (two patients), pneumonia (two patients), thrombophlebitis (two patients), decubitus ulcer (two patients), and pulmonary embolus (one patient).

TABLE 4.—*Amounts of Time Spent on Bed Rest and in Hospital of Fifty-five Patients with Osteoporosis*

Time, Wk.	Strict Bed Rest, Patients	In Hospital, Patients
Up to 1	1	0
1-2	7	8
2-3	15	10
3-4	12	5
4-5	8	14
5-6	8	10
6-7	0	4
7-8	2	2
Over 12	1	1
Over 16	1	1

The most important complication to recognize early was paralytic ileus, with severe electrolyte imbalance. It was necessary to perform gastric lavage in four patients with severe ileus associated with back pain and fracture.

Follow-up Examinations: In this series 25 patients returned to their usual way of life. They were classified as comfortable up to four years after discharge. In the other 30 patients, pain continued to be a troublesome problem. However, 20 of these were able to carry on with useful activity but with the need for rest. Of the remaining 10 patients with severe symptoms, 4 had surgical explorations in an almost desperate attempt to alleviate severe back pain. Six others continued to complain bitterly and seek medical attention.

Fifteen patients required two hospital admissions, six patients required three admissions, and three required four admissions; the last three were still in pain at the time of last follow-up examination.

Suggested Program for Management of Acute Phase: In an effort to reduce exacerbations, the following regimen is suggested. After the first three weeks, if pain has subsided, the patient should not be allowed to be up, even without symptoms, for more than one-half hour at a time. This program should be insisted on for a week or two. After this, gradual lengthening of periods of activity, but with insistence on one or more daily rest periods, will give a good result. After a month exercises are begun, including the use of heel cord stretching, abdominal and gluteal setting, and those designed to increase breathing capacity. Later, if provision for swimming or pool therapy at regular intervals can be provided, considerable improvement in strength may be expected.

Injections for Tendinitis: One of the common sources of pain in patients with round back due to osteoporosis results from stretching of the ligaments over the spinous processes, usually at the apical part of the curve of the round back. Indeed, in some patients, once they were ambulant tendinitis was the sole cause of persistent back pain. In such cases the instillation of a local anesthetic preparation such as procaine and 25 mg. of hydrocortisone was sometimes quite effective. In order to determine this, it is helpful to examine the patients while they lie prone over a table so that the palpating finger can precisely localize the site of pain. If it is sharply localized to one fingertip-sized area over a spinous process or rib, local injection treatment is indicated. We have the impression that in some of the patients who complained the vertebral compression was not in itself painful but, rather, the pain was due to tendon or ligamentous irritation. In such instances, the patient's response to injection treatment was as dramatic as it occasionally is when tendinitis occurs elsewhere in the body.

Follow-up in Convalescence: The patient's height, weight, respiratory excursions, and mobility should be checked periodically, even when the patient is asymptomatic. The patient should be repeatedly instructed on proper habits of bending and lifting and should be told that the disease is a lifelong one requiring long follow-up care. An active program of life, interspersed with adequate, frequent, but short periods of recumbent rest is the *sine qua non* in persons afflicted with severe osteoporosis.

In a certain number of patients, osteoporosis and its sequelae constitute a chronic, refractory, disabling illness and lead to a vicious cycle of enforced recumbency, continuing fractures, depressions, and discouragement. Nevertheless, most patients can be expected to improve, despite roentgenograms which may give the appearance of extreme deformity and demineralization. Improvement often requires months to years, and considerable time should be spent with the patient to prevent discouragement and consequent failure to abide by the outlined programs of treatment.

The Use of Hormones.—Thirty-eight patients received some hormone therapy; 17 discontinued this therapy within a few months and 21 received hormone therapy continuously for one or more years. These included one patient who received such therapy for one year, three who received it for two years, five for three years, four for four years, three for five years, three for six years, one for seven years, and one for eight years. Although almost half of the patients discontinued hormone therapy because of disinclination or significant side-effects, more than half of the patients were able to continue therapy with hormones. Indeed, 13 patients at the time of writing have taken hormones continuously for four or more years (table 5). Of the 21 patients receiving therapy with hormones for a year or more, 2 were men and 19 were women.

Preparations in Use: A variety of preparations have been used. Since estradiol benzoate has been one of the few preparations [5] with the documented ability to produce calcium retention in balance studies, it was used, in doses varying from 1.66 to 3.32 mg., several times weekly. Methyltestosterone, 10 to 20 mg. per day, was also added as a starting regimen. Three patients have continued to receive such therapy for six years without serious side-effects. On the other hand, most of the patients could not continue on such a program, unless dosages were reduced drastically, so other preparations have been used in such instances. Three patients have been given methyltestosterone, 10 to 20 mg. daily, and conjugated equine estrogens, 1.25 mg. a day, for at least five years with minor intolerance. Yet other patients have not been able to tolerate these same dosages for more than one month. As other preparations have become available, we have not been reluctant to use them. Among the preparations which have been used in patients in this series, with satisfactory results, from the standpoint of tolerance, are a preparation of 2.5 mg. of estradiol monobenzoate and 50 mg. of testosterone isobutyrate (Femandren linguets); one of estradiol and methyltestosterone in a 1:10 combination (Gynetone); one of 90 mg. of testosterone enanthate and 4 mg. of estradiol valerate (Deladumone); fluoxymesterone (Halotestin); conjugated equine estrogens (Premarin); one of 50 mg. of testosterone cyclopentylpropionate, 2 mg. of estradiol 17-cyclopentylpropionate, and 5 mg. of chlorbutanol, in cottonseed oil (Depotestadiol); and a multivitamin preparation with estrogens and d-desoxy-ephedrine hydrochloride (Mediatric). We have had no experience with the use of strontium.

The problem of optimum dosage is a confusing one. We have had great difficulty in raising doses to so-called metabolically active levels, since intolerance has followed rapidly. Moreover, it has not been convincingly shown that increased dosages mean increased net storage of calcium. It seems to us more important to use the greatest quantity the patient can be counted on to take, over as long a period of time as possible, with minimum intolerance, of whatever preparation one is most familiar with.

Complications: We have not been able to use hormones with confidence, however, since patient tolerance has varied immensely. The usual policy has been to use smaller rather than larger doses, and to use mixed therapy. Of 21 patients receiving hormones for one or more years, bleeding has occurred at one time or another in one-third of the women. Hirsutism has been frequent. Fluid retention has not been bothersome, with two exceptions. The complications, although at times troublesome, have been minimized, provided the patient has been completely briefed about the problems prior to the start of treatment.

TABLE 5.—*Follow-up Data on Patients with Osteoporosis*

Year Admitted	Patients, No.	Progress Followed to Present	Deaths	Hormones Used Continuously	Hormones Discontinued	Improved or Comfortable	Worse
1950-1951	4	3	1	1	2	3	0
1951-1952	4	4	0	3	1	4	0
1952-1953	8	6	0	5	3	6	2
1953-1954	11	8	0	4	3	9	2
1954-1955	12	10	1	3	2	9	2
1955-1956	6	6	0	3	3	5	1
1956-1957	8	6	0	1	2	5	3
1957-1958	2	2	0	1	1	2	0
	55	45	2	21	17	43	10

No cases of cancer have occurred, nor are we impressed that the often-quoted relationship between the use of sex hormones and the production of cancer is actually substantiated by any valid clinical evidence in human beings. Unfortunately, the measure of effectiveness of hormone treatment is purely a subjective one.

Other Results of Hormone Treatment: The useful effect of hormones in most of these patients has been seen in the response of the patient's mood. Such changes have included increased appetite, ability to sleep better, less preoccupation with troubles, and greater capacity for activity. Patients who desired to continue treatment felt that they experienced a definite boost with hormone treatment, which was not noted when hormone administration was discontinued. No biochemical evidence of benefit was noted, nor was there any increased roentgenographic density noted, even in patients

receiving long-term treatment. However, the beneficial effect of hormone therapy has been impressive enough often enough to warrant its use in patients with more severe cases of osteoporosis, despite the problems of intolerance.

The use of hormones depends on some knowledge of their action. In some patients it is possible to counteract excessive estrogenic or androgenic effects by "juggling" the mixed dosages and by cyclic administration and "rest" periods. If the patient has been told that bleeding may occur and if she is carefully checked for this by a gynecologist, one can sometimes continue therapy indefinitely and eventually reach a program of dosage with a preparation which is well tolerated. In cases of intolerance, various preparations should be tried. We have found that it is usually possible to find some dose of some estrogen-androgen hormonal combination which is tolerable.

Indications for Diagnostic Examination and Treatment

It is our feeling that if the patient is under 55 years of age, and especially if there are only one or two vertebrae spontaneously compressed, every diagnostic test should be utilized to rule out some condition other than osteoporosis, including open biopsy, marrow examination, and 24-hour urine calcium determination with the patient on fixed as well as unrestricted diet. Serum calcium, phosphorus, alkaline phosphatase, and total serum protein levels and electrophoresis of plasma protein should be obtained in such patients. Roentgenography of the skull as well as intravenous pyelography should be performed. Usually, the diagnosis can be established by such means, if a condition other than osteoporosis exists. Where indicated, consultations to evaluate the gastrointestinal and renal systems are helpful.

In the event that all test results are negative, one can assume that osteoporosis is the diagnosis. However, especially with patients in the younger age group, some unusual condition such as rheumatoid arthritis of the spine (Marie-Strümpell arthritis), osteitis deformans (Paget's disease), or polycythemia vera may eventually be diagnosed as the cause of collapse. Therefore, patients with the diagnosis of "idiopathic" osteoporosis who are under the age of 55 years should be rechecked in a year or more, with repeat study.

Once the diagnosis has been satisfactorily established, it has been our policy to use hormone therapy only if the patient's history has been characterized by chronic, exacerbating attacks, with roentgenographic evidence of obvious demineralization. Patients who have had no previous history of back pain and who convalesce satisfactorily from their first hospitalization are not given hormone therapy unless exacerbation and readmission ensue.

In some patients, no matter how vigilant the treatment with all of the available techniques, improvement does not occur. We have the impression that patients who have had rheumatoid arthritis treated with corticosteroids or other concomitant illness are apt to do poorly. In such cases, months drag by and every attempt to render these patients ambulant is met by a setback. It is because of such pathetic problems that physicians should be alert to the needs for an early diagnosis of osteoporosis and for establishing a prompt and early program of future activity geared to the patient's abilities.

Summary and Conclusions

Osteoporosis is the most common of all diseases producing vertebral compression. The diagnosis can be made only by the exclusion of other causes. Osteoporosis is characterized by remissions and exacerbations, producing shortening of stature, pain, and deformity. In this series of 55 patients, more than one-half had symptoms lasting for one to five or more years. In this series, 12 of the 46 women afflicted with severe osteoporosis had a history of low dietary calcium intake, induced menopause, and cholecystectomy. Such a triad should alert one to the possibility of the presence of this disease.

Relapses are common. Of 55 patients in this series 10 did not improve. They required a series of successive, seemingly never-ending, hospitalizations and continual care. On the other hand, most patients with severe osteoporosis can be returned to a reasonably comfortable life, especially if they are taught to adapt themselves to their functional abilities. One-third of these patients required absolute bed rest for six weeks before symptoms subsided sufficiently for ambulation. It is not necessary to treat the fractures with plaster casts. Indications for hormonal treatment are guided largely by the duration and severity of the patient's symptoms and by their tolerance to sex hormones. Long-term hormone therapy was tolerated by about half of the patients in whom it was used.

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PHYSICAL MEDICINE IN MANAGEMENT OF PATIENTS WITH POSTMASTECTOMY LYMPHEDEMA

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Lymphedema affecting the upper extremity after radical operations on the breast was studied in 220 patients. Limb volumes measured by displacement of water made it possible to assess the results of treatment. The treatment program here described consisted of a period of some days in a department of physical medicine and rehabilitation, followed by a period of home treatment which was usually prolonged. During the first period manual and mechanical massage were used, in addition to isometric exercises and spiral bandaging. During the second period the patient carried out certain instructions, especially involving exercise, bandaging, and elevation of the extremity. The results were sometimes only palliative, but the objective data as well as the reactions of the patients show that this program generally reduced the discomfort and disability caused by the lymphedema.

One of the most distressing sequelae of radical mastectomy is the development of lymphedema of the upper extremity. Haagensen [1] stated that it is "the only postoperative complication of any consequence." If the edema is mild, the distress may be related only to the appearance of the extremity and the problem of fitting the sleeves of clothing to it. When the edema is moderate or severe, it may also produce distress because the limb is cumbersome, because of sensory disturbances, including pain, or because of the patient's high susceptibility to cellulitis after minor trauma or insect bites. If it is severe, the patient may be almost completely disabled.

In 1948, Stewart and Treves [2] reported lymphangiosarcoma occurring as a late complication of postmastectomy lymphedema. It may develop after the edema has persisted for eight or more years. It has been suggested that the incidence may run as high as 10% in those patients with postmastectomy lymphedema who survive long enough.[3] Whether minimizing the severity of the lymphedema affects this incidence is not known.

Incidence and Causes of Postmastectomy Lymphedema

Reports on the incidence of postmastectomy lymphedema vary widely. Some of this variability is due to differences in the definition of edema. There are no volumetric studies of the incidence of lymphedema in a large series of patients having radical mastectomies. Further confusion is created by mixing together what Haagensen [1] called "postoperative edema," which occurs in the immediate postoperative period and is due to "some sort of fault in surgical technique," and "secondary edema."

The literature on the subject seems to deal with at least three syndromes. One of these is an acute transient edema occurring immediately postoperatively. The second is an acute painful edema with its onset in the first three or four weeks after operation. This has been reported to respond favorably to a variety of therapeutic agents and procedures, including adrenal corticosteroids, phenylbutazone, antibiotics, and sympathetic blocks. It also seems to be transient. The third syndrome, with which this paper is primarily concerned, is characterized by persistent but usually painless edema several weeks, months, or even years after operation. While the precise incidence of this syndrome is not known, it is likely that it occurs to some degree in about 50%, and is a significant complication in 10 to 15% of patients undergoing radical mastectomies of the Halsted type.

Etiology.—Disagreement exists about whether the condition is due primarily to venous or to lymphatic obstruction and on the role played by the autonomic nervous system. Villasor and Lewison [4] and Treves [5] concluded that there was no single cause. Treves [5] has made the following statement.

> Probably the most frequent cause is interference with the return of lymph because of ablation of the profunda lymphatics with the nodes of the axilla. Interference may be due directly to the axillary dissection or to cicatrization following infection or fibrosis following roentgen-ray therapy. Angulation of the vein, interfering with both venous return and return of lymph from vessels in the wall of the vein, and reflex spasm of the axillary vein must likewise be assessed as bearing directly on the problem.

In Treves' series of 319 patients, obesity was a predisposing factor. The extent to which the axillary nodes were involved by metastasis at the time of operation was not related to the incidence or severity of the edema. Postoperative infection or delayed wound healing, acting alone, was not associated with an increased incidence of edema.

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When superimposed on other factors, however, these augmented the incidence and severity of the swelling.

Haagensen [1] agreed with Halsted's [6] early concept that postmastectomy lymphedema is due to infection occurring in an arm with an impaired lymphatic circulation, even though this infection may not readily be detected. He described the work of Ju and Habif, which showed that there is delayed lymphatic drainage from the arm for the first two to four weeks after operation. Although drainage approaches normal at the end of a month, it never reaches normal. In addition to this, the precipitating cause of the edema, Haagensen stated, is infection, and he adds, "if the infection is treated early the process is reversible." Both Haagensen and Treves pointed out the constant threat of lymphedema that faces most postmastectomy patients. Treves [3] has made the following comment.

> It is well to remember that the onset of swelling in patients previously free from this complication may be initiated by any minor infection or trauma. Friction from clothing, trauma to the arm, a scratch or a mosquito bite, sunburn or a minor thermal injury, paronychia or ringworm of the nail, a cut at the time of manicure, any of these may induce lymphedema, which often persists. The circulatory balance is so fine that seemingly trivial incidents may produce this distressing complication; and, once produced, the process is rarely reversible.

Surgical Treatment

Modifications of the Halsted operation to provide a lymph-draining bridge across the axilla have been tried, with varying degrees of success, in patients suffering from postmastectomy lymphedema. Other modifications have involved resection of the axillary vein or artery. The literature on this problem has been extensively reviewed by Treves.[7] Surgical correction, once lymphedema has occurred, has been based on resection of the lymphedematous tissue or attempts to stimulate the formation of new lymphatic channels to bridge the axillary obstruction. Drainage with Southey tubes and blocking of the stellate ganglion have also been described. Amputation has been performed in rare cases.

Nonsurgical Treatment

The nonsurgical treatment of patients with postmastectomy lymphedema is based, first, on elevation, massage, and use of the muscular pumping action to increase lymphatic and venous flow out of the limb, and, second, on elastic support of the limb to keep the swelling from recurring. Such measures are often palliative, in the sense that the elastic support cannot be abandoned. However, in a significant but as yet undetermined proportion of cases, elastic support can be left off without a return of the swelling.

Physiological Considerations.—The rationale of such nonsurgical management is based principally on Starling's hypothesis about the factors affecting the passage of water through the capillary wall. As Drinker and Yoffey [8] pointed out, this is now more an established mechanism than a hypothesis. Figure 1 is a diagram incorporating the principal features of the Starling hypothesis as well as some of the concepts put forth by Pappenheimer.[9]

Pappenheimer pointed out that the capillary wall is about 0.3 μ thick. The pores which are presumed to be in the intercellular cement substance make up only about 0.2% of the surface area of the capillary wall. Through the pores small molecules such as water and electrolytes can pass easily. The water passes through the pores partly because of filtration pressure, and the substances dissolved in it wash through the pores with the water; however, most of the transfer of water and its solutes through the pores is by diffusion, which occurs readily because the distance through the wall is so small. There is some restriction to diffusion imposed by the size of the pores and this exerts a "sieving" action, particularly on the larger molecules. Oxygen, carbon dioxide, and lipid-soluble substances pass through the wall anywhere and have a large surface area available for their transfer. Since the protein molecules cannot pass freely through the pores, they exert an osmotic pressure, which draws water into the capillary from the tissue fluids. As the filtration flow of water through the pores decreases, the sieving effect is less marked and the proteins of the plasma and tissue fluids come more into equilibrium. Such a reduction of filtration would occur if the hydrostatic pressure of the tissue fluids increased toward the level of the capillary hydrostatic pressure, as in firm or tense edema.

Protein that leaves the blood circulation through the capillary wall returns to the blood, if at all, by way of the lymphatics.[10] The excess of water entering the tissue spaces through the capillary wall over that reentering the capillary also leaves by way of the lymphatics.

The difference between the osmotic pressure due to plasma colloids and that due to tissue-fluid colloids is the effective osmotic pressure tending to draw water into the capillary from the tissue fluids. It is theoretically a trifle greater at the middle of the capillary than at either end. The difference between the plasma hydrostatic pressure and the tissue hydrostatic pressure is the effective hydrostatic pressure which tends to drive water out of the capillary. Because of the decrease of blood pressure, the effective hydrostatic pressure falls progressively as the blood passes from the arteriolar to the venous end of the capillary.

The relationship between these two effective pressures is shown in figure 2. Wherever the effective hydrostatic pressure is greater than the effective osmotic pressure, more water leaves the capillary than enters it. Wherever the effective hydrostatic pressure is less than the effective osmotic pressure, more water enters the capillary than leaves it. Any-

thing that increases the effective hydrostatic pressure or decreases the effective osmotic pressure will disturb the balance in favor of the passage of more water out of the capillary and less back into it. If the lymphatics do not take care of the excess, the accumulating water will build up the tissue hydrostatic pressure until an equilibrium is reached again.

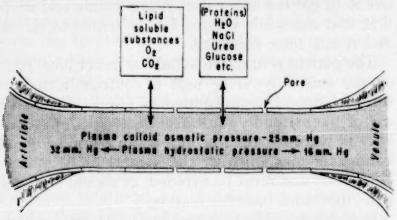

Fig. 1.—Factors influencing exchange of water between capillary blood and tissue fluid. Protein molecules can pass through pores only with difficulty. Values for different pressures are arbitrary but of order of magnitude of those that actually exist—tissue hydrostatic pressure, 8 mm. Hg; tissue colloid osmotic pressure, 10 mm. Hg.

Microcirculatory observations have shown that there is much variation from moment to moment in the flow of blood through individual capillaries in a capillary bed.[11] This would imply considerable change in the hydrostatic pressure within the capillary. While the Starling hypothesis may not be applicable at all times to any individual capillary, clinical experience with the production and correction of edema due to various causes supports the idea that the hypothesis does apply to capillary beds as a whole.

The capillary hydrostatic pressure may be increased by arteriolar dilatation (produced by local heating, generalized heating, or muscular activity) or by venous obstruction (produced by such factors as inactivity of the muscle "pump," congestive heart failure, constricting clothing, and incompetence of the valves). The tissue hydrostatic pressure may be reduced by stretching of the skin and subcutaneous tissues, with loss of their elasticity. These tissues, then, are abnormally loose when the excess fluid is removed and the swelling can easily recur. The osmotic pressure due to plasma colloids may be reduced by hemodilution, by specific decrease in the plasma proteins, or by increase in permeability to proteins of the capillary membrane. In the last-mentioned event, or in the event of a slowing of filtration rate and its accompanying reduction of the sieving of plasma proteins from the water leaving the capillary, the concentration of protein in the tissue fluids will increase.

All these factors are known to produce edema. So also may lymphatic obstruction produce edema. Lymphatic obstruction may result from inactivity of the muscle "pump," or incompetent valves in the dilated vessels, as well as from the more obvious factor of destruction by surgery of communicating channels between the superficial and deep lymphatic collecting systems.

On this theoretical basis one would expect lymphedema, once established, to tend to be a progressive condition which would not subside spontaneously. Furthermore, any nonsurgical program for its correction would have to provide for a "shoring up" of the tissue hydrostatic pressure while the return of elasticity of the skin and subcutaneous tissues toward normal is awaited.

Mayo Clinic Program.—The program of treatment [12] that my colleagues and I have employed for the past four years has aimed at reducing the volume of the extremity by simple standard procedures and at endeavoring to prevent by bandaging any swelling of the extremity for a sufficient period to permit shrinkage of the subcutaneous tissues and skin to a more nearly normal size, so that tissue turgor would then be maintained at this size. The treatment has been in two phases. The first is a period of treatment in the section of physical medicine and rehabilitation and the second a program of self-treatment at home. Since improvement may be slow and may require considerable attention for weeks or months, the financial burden may be excessive, if the patient is not taught to carry on her own treatment at home.

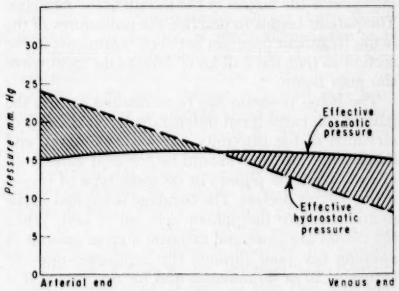

Fig. 2.—Relationship between effective hydrostatic pressure and effective colloidal osmotic pressure. Water passes through capillary wall in both directions throughout its length. Where effective hydrostatic pressure is greater than effective colloidal osmotic pressure, more water leaves capillary than enters it (*left*). When this relationship is reversed, net exchange of water is reversed (*right*).

The treatment in the section of physical medicine and rehabilitation has ideally been given twice daily. It has consisted of a 30-minute period of centripetal mechanical massage with use of a "vasopneumatic" device. This is followed by 7 to 10 minutes of manual kneading and stroking massage to reduce edema, particularly in the more indurated areas. The patient is instructed in the method of

performing isometric or nearly isometric exercises of the arm and forearm muscles to use the pumping action of the muscles on the veins and lymphatics. She is taught how to bandage her own upper extremity with an adequate elastic bandage. We have used two 3-in. woven bandages stitched together end to end and applied from the dorsum of the hand up to about the level of the insertion of the deltoid muscle. A simple spiral bandaging technique seems to be as good as any. We have occasionally tried a figure-eight technique at the elbow, but it leads to constriction of the venous and lymphatic circulation at that level. There is no need to incorporate the fingers or the thumb in the bandage. The patient begins to practice the procedures of the home treatment program between treatments in the section so that she will know how to do them when she goes home.

TABLE 1.—*Measurements Before Treatment of 193 Patients with Lymphedema**

Edematous Arm, Liters	Total Patients	Control Arm, Liters: Less Than 1.5	1.5-1.9	2.0-2.4	2.5 or More
1.5-1.9	6	1	5	..	..
2.0-2.4	24	1	14	9	..
2.5-2.9	42	..	14	26	2
3.0-3.4	61	1	9	39	12
3.5-3.9	34	..	5	13	16
4.0-4.4	14	..	..	4	10
4.5-4.9	4	..	..	2	2
5.0-5.4	4	..	..	..	4
5.5-5.9	2	..	..	..	2
6.0 or more	2	..	..	1	1
Total	193	3	47	94	49

* All measurements made by water displacement.

The home program has been devised so that the patient can carry it out independently. It consists of elevation of the extremity, isometric exercises, and bandaging. The limb should be elevated most or all of each night on pillows or on some type of frame, if the patient prefers. The bandage is applied in the morning before the patient gets out of bed. When the tissues are loose and inelastic a great amount of swelling can pour through the capillaries into the tissues in 20 or 30 minutes, and for this reason it is important to apply the bandage prior to arising. During the day the patient takes a half-hour out of each two hours to lie down, with the arm elevated. She performs the isometric exercises frequently during this half-hour period. At the end of the half-hour she removes the bandage and reapplies it immediately. On retiring at night she may remove the bandage a few minutes before lying down, for purposes of bathing the limb. The bandage is not worn at night. The use of rubber household gloves will permit the patient to immerse her hand with the bandage on.

After two or more weeks on this home program, if the reduction of the swelling has been satisfactory, the interval between the periods of elevation, exercise, and changing of the bandage during the day is lengthened by an hour. Another increase can follow in another two or three weeks, if all goes well, and finally the patient should attend to her arm at about noon and before the evening meal, with additional rewrapping of the bandage should it become disarrayed. The speed with which the patient progresses with this program may be slower than that outlined above, particularly if the reduction in the edema is proceeding slowly. The objective is to get the arm as small as possible and keep it at that size while waiting for the tissues to shrink and regain their elasticity.

The patient is urged to avoid the use of local heat on the extremity, since heat is contraindicated in the presence of noninflammatory edema. Excessive use of the extremity must also be avoided, particularly in warm weather or in a warm room. Careless bandaging may obstruct the venous or lymphatic circulation and must be avoided, as should clothing with the same harmful feature.

It is not possible to determine in advance which patients will be able ultimately to go without elastic support. After the volume of the limb has been held at a minimum for about eight weeks, the patient tries leaving the bandage off in the evening for about two hours before bedtime. If the tape measure detects no increase in size, the bandage may be left off for three hours the next evening. Regular increases are made until she has found out how long she can leave the bandage off without exacerbation of the edema.

The actual value of the vasopneumatic device in the treatment program is not known. A few patients have done well without it, but the number we have treated without it is too small for reliable comparison. Any machine may be expected to provide a rather inefficient massage, with regard to emphasizing the areas most in need of massage; however, a machine does not fatigue and may make up in time of action for what it lacks in efficiency of application. Other pumping machines are available, but I have not yet had the opportunity to use any of them.

TABLE 2.—*Measurements Before and After Treatment in Ninety-five Patients*

Edematous Arm, Liters	Group*	Total Patients	Control Arm, Liters: 1.5-1.9	2.0-2.4	2.5 or More
1.5-1.9	A	2	2	..	..
2.0-2.4	B	7	5	2	..
	A	11	7	4	..
2.5-2.9	B	19	8	11	..
	A	32	8	23	1
3.0-3.4	B	32	5	23	4
	A	28	3	18	7
3.5-3.9	B	22	2	11	9
	A	14	..	4	10
4.0-4.4	B	8	..	2	6
	A	4	..	..	4
4.5-4.9	B	3	..	1	2
	A	3	..	1	2
5.0 or more	B	4	..	..	4
	A	1	..	..	1
Total		95	20	50	25

* A: after and B: before treatment over a few days in the section of physical medicine and rehabilitation.

Results.—From October, 1955, until April, 1959, 220 patients were seen in the section of physical medicine and rehabilitation at the Mayo Clinic because of lymphedema of the upper extremity. A previous report [13] presented some observations on 96 of these, seen in the period October, 1955, to August, 1957. A similar statistical analysis was made on the 124 patients seen from August, 1957, to April, 1959, to check the validity of the figures obtained from the first 96 cases. Since the results were in general nearly the same with the second group as with the first, the entire series has been grouped together in this report. Limb volumes were measured by displacement of water, as previously described.[12]

Of the total 220 patients, 27 have been omitted from the study for a variety of causes. Twelve had had some treatment for lymphedema either by us or elsewhere before any measurements were taken; five had a treatment program different from that used generally in this series; four had not had mastectomies; three had inadequate measurements before treatment; one was a man; one had edema that developed acutely after an insect bite 10 months after mastectomy, and this edema was already subsiding spontaneously when the patient was first seen; and one had had surgical excision of some of the lymphedematous tissue.

The distribution of the 193 cases included in this study is shown in table 1. Here the volumes of the edematous arms are grouped in relation to the volumes of the contralateral (control) arms. The table shows that although most of the edematous upper extremities were about 1 liter larger than the normal contralateral extremity, there was wide variability in the severity of the edema in the patients sent to the section of physical medicine and rehabilitation for its treatment.

For 95 patients, measurements were taken before treatment and at the end of a few days of treatment twice daily in the section, as outlined above. Table 2 relates the distribution of the volumes of the

TABLE 3.—*Percentage Reduction of Edema During Treatment in Section in Ninety-five Patients*

	Before Treatment			After Treatment		
Greater Than Control Arm, %	No.	%	Cumulative Percentage	No.	%	Cumulative Percentage
0-19	4	4	4	23	24	24
20-39	33	35	39	40	43	67
40-59	35	37	76	25	26	93
60-79	13	14	90	4	4	97
80-99	6	6	96	1	1	98
100 or more	4	4	100	2	2	100
Total	95	100	...	95	100	...

edematous arms to those of the normal arms for these 95 patients before and after the series of treatments. It can be seen that the difference in the sizes of the arms is generally less after treatment than before, since in each vertical column the number of arms that are much larger than their controls decreases, while the number of arms that are slightly larger than their controls increases. The extent of reduction of the edema in individual cases is obscured in this form of tabulation.

Table 3 expresses the amount of the edema (difference in volume of the two upper extremities) as a percentage of the volume of the normal upper extremity. The 95 patients are again tabulated according to the severity of the edema before and after treatment. The comparison of the columns headed "Cumulative percentage" is the most striking feature of this table. It is seen that only 39% of patients had edema that was less than 40% of the normal volume of the arm before treatment, while 67% fell into this group after treatment. After treatment the edema in 24% of patients was less than one-fifth the volume of the normal arm, while only 4% could be classified thus before treatment.

TABLE 4.—*Rate of Improvement During Treatment in Section in Ninety-five Patients*

	Day of Treatment						Total Patients	
Reduction of Edema, %	1	2	3	4	5	6 or More	No.	%
0-9	1	4	6	2	1	2	16	17
10-19	1	3	5	1	1	2	13	14
20-29	..	7	4	3	1	4	19	20
30-39	..	2	8	3	5	5	23	24
40-49	..	1	2	2	3	4	12	13
50-59	..	..	..	1	1	4	6	6
60 or more	..	1	2	1	1	1	6	6
Total, no.	2	18	27	13	13	22	95	..
Total, %	2	19	28	14	14	23	..	100

The rate of improvement during twice-daily treatment in the section of physical medicine and rehabilitation is tabulated in table 4. Here the "percentage reduction of edema" is the amount of reduction of the limb volume expressed as a percentage of the initial amount of edema. Despite the fact that there are 95 patients in the series, not many fall in any one group. For the 27 patients who had treatment for three days a wide range of reduction of edema is evident. It is obviously not possible to make a firm prediction in a particular case that 20 or 30% of the edema will be gone in three days. Table 4 shows a tendency for greater reduction of edema to be obtained with longer periods of treatment. It will be seen that 9 of the 48 patients who stayed for four or more days of treatment obtained less than 20% reduction in the edema, while 9 others had reduction of the swelling by 50% or more.

In order to preserve the statistical advantage of larger groups of patients, table 5 has been constructed. As an example, 75 patients stayed three or more days for treatment and of these 75 patients 48 stayed for four or more days. While 65% of those who stayed for four or more days had reduction of more than 30% of their edema, only 57% of those remaining three or more days reached this goal. There is generally a greater difference between "three or more days" and "four or more days" than between any other consecutive periods of time in this table. This table, based on data from 95 patients, confirms the suggestion gained previously

from 43 patients that the optimal period of time for this initial treatment in a physical therapy department is four days. It should be pointed out that the results in table 5 with regard to those improved "more than 30%" are not as good as those found with the smaller series,[13] but results in the "more than 40%" group are distinctly better.

No concerted effort has been made to collect long-term follow-up data and observations of the results of the home treatment program. In some instances it is known to have been successful, while in others it has failed to reduce the edema further or even to maintain a reduction obtained in the department. A few patients have been able to forego use of an elastic support without recurrence of the edema. At the other end of the scale, a few require continuous elastic support while up and around. Most patients probably fall in an intermediate group; they wear elastic supports while doing housework but can leave the support off for a few hours, particularly for social events, without an apparent increase in the size of the arm.

TABLE 5.—*Rate of Improvement During Treatment in Section of Ninety-five Patients*

		Improved					
		More Than 20%		More Than 30%		More Than 40%	
Days of Treatment	Patients	No.	%	No.	%	No.	%
1 or more	95	66	70	47	50	25	26
2 or more	93	66	71	47	51	25	27
3 or more	75	55	73	43	57	23	31
4 or more	48	39	81	31	65	19	40
5 or more	35	29	83	24	69	13	37
6 or more	22	18	82	14	64	9	41

While our observations on the home treatment program are meager and probably are not representative of the entire group, they merit brief discussion. A total of 21 patients had measurements before and after treatment in the section of physical medicine and rehabilitation and after a period of treatment at home. Of eight who had improved little in the section, five either got worse or improved very little at home, but the other three did well at home. The other 13 had obtained relatively good results under treatment in the section. Of these, seven did rather poorly on the home program, but the other six did well on the home program and four have been able to abandon elastic support.

An additional 10 patients came back to the clinic but were not reevaluated in the section of physical medicine and rehabilitation. Of these, five were said to show improvement with regard to the lymphedema and in the other five no mention was made of the state of the arm.

It would seem fair to guess that about one-half the patients do fairly well with the home program while the other half either have no success with it or abandon the program when they discover after two or three months that the edema can be controlled only as long as they continue the supportive bandaging. The patient then chooses whether to continue with the annoyance of elastic support or the annoyance of a swollen arm. What influence, if any, this choice has on the likelihood that lymphangiosarcoma will develop is not known.

Some of the patients who did poorly on the home treatment program had followed that program conscientiously. All of those who did well on the home program had followed it conscientiously except one patient with moderate edema who found that bandaging aggravated the edema of the hand.

The recent trend has been to urge patients to continue with bandaging for about two months after the extremity has reached a minimal size. This minimal size may not be reached, however, for two to six months after the beginning of treatment. The over-all program may consume more time than was originally thought. The timing of the program must be adjusted according to the progress of the individual patient.

Comment

Treatment programs for patients with postmastectomy lymphedema such as that described herein are sometimes only palliative. However, most patients have been well satisfied with the results of the program, even if they have not been able ultimately to go without elastic support for more than a few hours at a time. Success with other methods of correcting the condition would appear to be met in no greater proportion of patients. Prevention is preferable to any method of correction now available, but it is not yet practicable.

Since the treatment program involves attending to the arm several times daily for several months, it is important that the patient learn how to carry it on without aid. It is economically burdensome to attend a physical therapy department frequently over such a long period. Professional treatment once or twice a week is not likely to be helpful. If rapid improvement is to be obtained, it will be in the first 7 to 10 days of treatment. Thereafter improvement will generally be slow whether or not professional treatment is continued in conjunction with the home program.

Several patients who have had success with our integrated program had previously had failure with the use of elevation, massage, or bandaging alone. The entire program, including the regular use of the pumping action of the muscles on veins and lymphatics, is more effective than the individual components alone. I have had little or no success in reducing the edema of a small number of patients who were unable to contract the muscles of the extremity.

Unless there is some good indication for the use of heat, such as pain in the shoulder or cellulitis of the extremity, it should not be used. Heat increases the tendency to edema, and edema is not an indication for its application in any form. Furthermore, the cutaneous blood supply has often been impaired by heavy roentgen irradiation, and this also is a contraindication to the use of heat.

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Comparison of the results obtained by the 52 new patients reported here with the results obtained by the 43 reported [13] previously shows that our experience with this method of treatment has been remarkably consistent over the past four years. Although one cannot predict reliably what will take place in a given patient, the results to be expected in a group of patients are quite well established for this program of treatment.

Messrs. R. P. Gage and David Sperling assisted in the statistical analysis of data presented in this report.

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URETHRITIS-CYSTITIS SYNDROME IN THE FEMALE

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Chronic or recurrent urethritis, with or without cystitis (urethritis-cystitis syndrome) occurs so frequently in women that both the patients and their physicians are likely to let the lesion escape adequate treatment. The proximity of the urinary opening to the vaginal and anal orifices allows constant exposure of the urethra to the mixed bacterial flora of the vaginal canal and rectum. The most common pathological lesion found in 2,450 women with this syndrome was a meatal stricture of the urethra. Complete cure was more often accomplished when a specific etiological diagnosis had been obtained by careful inspection of the urethral meatus, palpation of the urethral glands, and panendoscopic examination of the urethral lumen.

The management of the female patient who has experienced one or more attacks of cystitis is an important part of the "everyday" practice of urology. Many of these patients have been labeled "neurotic" because of failure to recognize the underlying pathology.

This communication deals with a study of our experiences in treating urethritis and cystitis in female patients seen during the past 15 years. During this period, a total of 2,450 female patients were seen for whom a diagnosis of "urethritis-cystitis syndrome" was made. During the past five years visits by female patients have averaged 3,380 per year. The incidence of urethritis in women is high, and many factors play a part in this common malady, which affects most women at some time or other during their lifetime.

The role of obstructions in producing urinary symptoms and infections is elementary in urology. What is often lost sight of is the fact that obstruc-

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tion need not be complete or even noticed as such by the patient in order to produce symptoms. The complex embryologic development of the urinary tract makes one wonder that anatomic defects causing partial obstruction do not occur more often. Another reason these lesions are so often overlooked is that there is a general notion that the absence of a prostate in the female eliminates the lower urinary tract insofar as obstructive lesions are concerned. This misconception on the part of so many physicians, including a goodly number of urologists, so greatly disturbed the late Dr. Alfred Folsom, a famous urologist, that about 25 years ago he wrote a treatise entitled "The Female Prostate" in which he emphasized the high incidence of vesical neck and urethral pathology in the female.

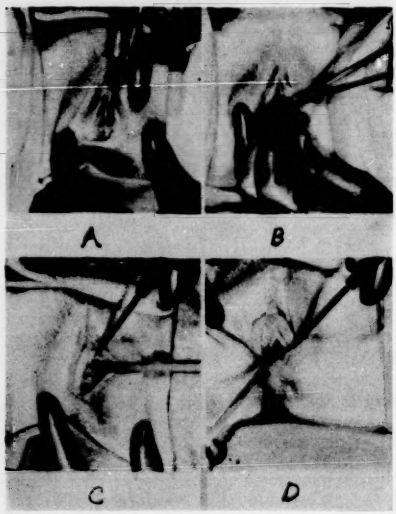

Fig. 1.—Meatotomy. *A*, incision in floor of urethra; *B*, excision of redundant lateral "flaps" of skin and mucosa; *C* and *D*, fulguration of margins of incision.

Symptoms

Even with a perfectly normal urethra and bladder, how is a woman to escape developing urethritis and recurrent cystitis in the face of repeated inoculations of pathogenic organisms due to the close proximity to the urethra of the vagina, the cervix, and the rectum? The anatomic changes that come about during the childbearing age further encourage lower urinary tract infections, and the changes resulting from the menopause also play important roles in the production of urethritis and recurrent cystitis.

Symptoms may be nonurinary in origin, as well as those referable to bladder and urethra. The urinary symptoms, in order of occurrence, are (1) frequency; (2) urgency; (3) dysuria; (4) nocturia; (5) straining to void; (6) slowness in emptying bladder; (7) dribbling; (8) retention of urine with residual; and (9) acute retention.

The nonurinary symptoms are (1) suprapubic soreness; (2) pain or soreness in flanks; (3) backache; (4) dyspareunia; (5) nervousness; (6) low-grade fever; (7) loss of appetite; and (8) nausea.

Most of these patients have multiple complaints, and many give a history of long-standing urinary symptoms. A great many women have urinary symptoms almost throughout life and seem to accept urinary frequency and occasional attacks of dysuria and urgency as more or less normal. Careful questioning often is necessary to bring out the true picture in most of these patients.

The pathology in the urethritis-cystitis syndrome is obstructive in nature in most patients. The narrow urethral meatus has been termed the most common anatomic defect in the urinary system. Obstruction that is caused by meatal stricture is the number one causative factor in urethritis and cystitis. A list of the abnormal findings is as follows: (1) narrow urethral meatus; (2) infected urethral glands; (3) urethral stricture; (4) hypertrophic urethritis; (5) vesical neck contraction; (6) trigonitis; (7) menopausal changes in urethral mucosa; and (8) urethral caruncle.

Extraurinary "associated" pathology is present in most patients in a variety of forms, such as (1) endocervicitis; (2) vaginitis and vulvitis; (3) anorectal area infection; (4) hemorrhoids; (5) cystocele; or (6) rectocele.

Diagnosis

Diagnosis of the urethritis-cystitis syndrome is made by correlation of a carefully taken history with the results of a proper examination. Result of urinalysis of a catheterized specimen is often normal, or nearly so, but in patients who are in a "flare-up" period the urine may contain numerous pus cells. The organisms found on urine culture vary considerably but most commonly are in the Escherichia coli group.

Careful inspection of the urethral meatus is important, and pressure over the urethra helps to determine the presence of infected urethral glands. When such pressure or stripping is applied, pus may be seen to exude from the urethral glands and the urethra is frequently quite sensitive to palpation. Calibration of the meatus and urethra should be a part of each examination and is better done by metallic Otis bougies à boule than by sounds. It is difficult to assess properly the meatus or the caliber of an urethral stricture by probing with a sound. A meatus of less than 26 French as calibrated by the Otis bougie à boule is classified as narrow and is usually subjected to meatotomy. This may be done as an office procedure, but it

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frequently is reserved to be done as part of the operative procedure when a transurethral resection of the bladder neck is done (fig. 1).

The panendoscopic inspection of the urethra is of the utmost importance in the diagnosis of urethritis and also in the determination of the degree of obstruction present in the vesical neck. There are some urologists who hesitate to diagnose vesical neck obstruction on the basis of panendoscopic findings. On the other hand, there are a great many urologists who have grown to depend on the panendoscopic picture for diagnosis of infravesical obstructions. We are among this latter group, and the results appear to justify this position. The bladder neck and trigone often may show hypertrophic changes, with intrusion of masses of thickened mucous membrane into the lumen of the posterior urethra and vesical neck. The roof of the urethra is the site of the most marked changes, and frequently the blood vessels in the mucosa are seen to be tortuous and dilated. The trigone and interureteric ridge often are thickened and hypertrophic, with a definite bas-fond behind the base of the trigone. Well-developed areas of bullous edema quite often are present in the vesical neck and trigone. The pathology most often encountered then is that of infected urethral glands, with or without a narrow meatus, and swollen and thick-

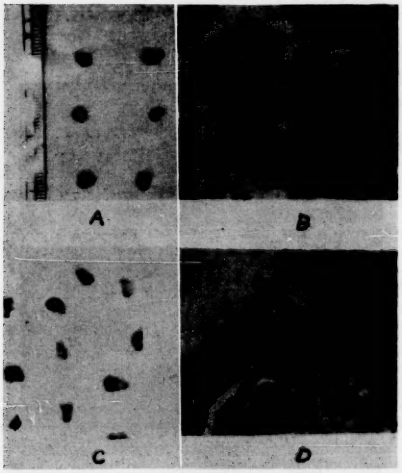

Fig. 2.—*A* and *C*, tissue resected from vesical neck; *B* and *D*, histological appearance of resected tissue revealing chronic inflammatory changes.

ened mucous membrane with hypertrophic folds or polypoid masses in the posterior urethra and bladder neck. No other instrument discloses the pathological changes so well as the McCarthy panendoscope (fig. 2).

Treatment

Treatment is intended to clear up both the urethral and the "associated" extra-urinary pathology. About one-half of these patients may be treated satisfactorily as office patients. Meatotomy

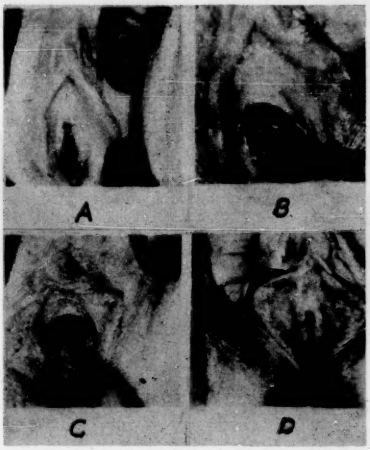

Fig. 3.—*A*, inflamed external meatus; *B*, traction on balloon bag catheter used to expose anterior urethra; *C*, appearance after fulguration; *D*, healed appearance six months later.

with excision of infected urethral glands is done, followed by urethral dilations at intervals of one to two weeks. Two points of technique of meatotomy in females that may be emphasized are as follows: 1. The incision is made with a no. 12 or "hawk bill" Bard Parker knife in the floor or "6 o'clock point" in the urethra. 2. Removal of each lateral flap of the opened meatus is then done in such a way as to excise most, if not all, of the infected urethral glands which are located in the anterior urethra. Excision of this mucosa effectively removes these glands. The bleeding is controlled satisfactorily by means of ferric subsulfate (Monsel's) solution.

In addition to the meatotomy, electrofulguration of the anterior urethral mucosa is done when the urethritis is extensive or a caruncle or caruncle-like area exists. Exposure of this portion of the anterior urethra, and especially the area involved in a caruncle, is greatly facilitated by traction on a balloon bag catheter placed in the bladder (fig. 3).

Urethral dilations may be done with use of ordinary urethral sounds. However, about 20 years ago female sounds were devised by the late Dr. Harold Turner of Houston, Texas, and we prefer this type of sound. Dilations are carried up to 30 to 32 F, gradually. Each sound is left in place for about 10 minutes, and afterwards a freshly made

mild silver protein (5% Argyrol) solution is injected or an antiseptic suppository placed in the urethra. Too rapid dilation is avoided. The size of the dilator is increased not more than one size on each successive treatment. Appropriate urinary antiseptics or antibacterial agents are prescribed in conjunction with the urethral treatments.

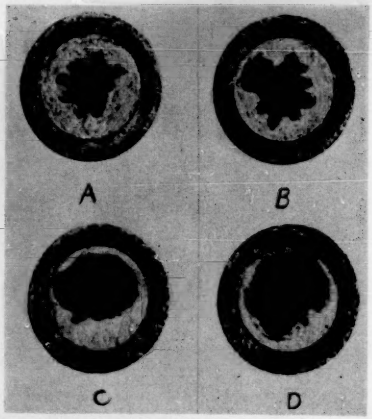

Fig. 4.—Cross-section drawings: *A*, cystoscopic appearance of vesical neck before transurethral resection; *B* and *C*, cystourethroscopic appearance of vesical neck during transurethral resection; *D*, appearance at completion of transurethral resection.

The cervix is inspected and proper measures carried out to eliminate endocervicitis as a focus of infection in the production of the urethritis. Cytological studies are done on all patients who have cervical erosion. In the elimination of simple endocervicitis it has been our practice to apply a 50% silver nitrate solution to the endocervix. Three to five such silver nitrate treatments at intervals of one to two weeks usually clear up the cervicitis. Warm saline or antiseptic douches are prescribed daily, and the patient is instructed as to the proper manner of administering the douche. We have been amazed at the large percentage of women who douche in an improper manner.

Patients who have a moderate to severe degree of obstruction or who have deep-seated infection in the urethral glands are advised to have a transurethral resection. This may be determined either on the basis of the severity of symptoms or on the panendoscopic appearance of the posterior urethra, vesical neck, trigone, and bladder. There may or may not be residual urine or bladder trabeculations (fig. 4).

We advise transurethral resection of the vesical neck and excision of urethral glands for about one-half of the women with recurrent urethritis-cystitis syndrome. The technique of transurethral resection is important and consists in careful resection of the hypertrophic or chronically inflamed mucosa of the proximal portion of the urethra. The mid-point of the urethra is considered to be the location of the sphincter, and extreme care is taken to limit the resection to the area proximal to this mid-point of the urethra. In following this technique we generally have had no incontinence, except in two patients who received either resection or fulguration past the mid-point in the urethra. Bladder neck and urethral suspension (Marshall-Marchetti) operation was effective in each instance in affording good urine control.

Transurethral resection of the female vesical neck is better begun in the roof of the urethra, followed by resection of the lateral walls of the vesical neck on either side. The floor of the vesical neck is resected last and care exercised not to cut too deeply on account of the danger of causing a vasicovaginal or urethrovaginal fistula. The final step in the operation is resection of the thickened trigone, particularly the portion between the ureteral orifices (fig. 5). This is comparable to excision of the wedge of tissue in the vesical neck when performing retropubic prostatectomy in the male. An indwelling balloon bag catheter, 22 French, is inserted, and the anterior urethral mucosa is exposed by traction on the catheter and fulgurated—a maneuver which is quite effective in eliminating the usually infected or inflamed anterior urethral mucosa, after which the meatus usually heals quite smoothly. Ordinarily the catheter is left in place for three days. The patient is dismissed from the hospital on the fifth or sixth postoperative day.

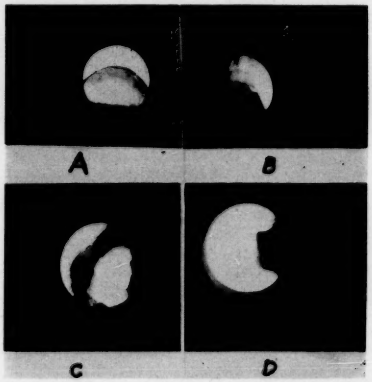

Fig. 5.—Steps of transurethral resection shown by endoscopic photographs. *A*, cutting loop in position for cut in roof of urethra. *B*, groove after resection of first bite of tissue; *C*, lateral wall of vesical neck during cutting of section of tissue; *D*, groove in lateral wall after cut has been completed.

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It is important to explain to each patient that healing of her resected urethra will require six to eight weeks or more. She may expect to experience dysuria, pain, urgency, and some hematuria during this healing period. Urethral suppositories, urethral dilations, and injections of Argyrol or other soothing medicaments are given during office follow-up treatments, usually at intervals of one to two weeks. Sulfonamides and other urinary antiseptics are prescribed to lessen the urinary infection during convalescence. The urine usually is free from infection within 8 to 10 weeks after the transurethral resection.

On dismissal, patients are advised to come back at intervals of 2 to 3 months for a period up to about 12 months. Cystourethroscopic inspection of each patient is done about 10 to 12 weeks postoperatively. At this time, light fulguration of any area of inflamed posterior urethra that is noticed often is of benefit. Such "touch-up" fulgurations have been helpful, in many instances. We have found that a special electrode guide for use with the panendoscope is quite useful in these touch-up fulgurations as well as in any instance requiring electrofulguration.

Summary

The urethritis-cystitis syndrome is a common malady in women. Many of these patients have been neglected in the past, and others have been labeled "neurotic." A carefully taken history and examination, especially calibration of the urethra with an Otis bougie à boule and panendoscopic inspection of the entire urethra and vesical neck reveal the true nature of this urethritis and cystitis to be obstructive in most instances. Meatotomy with elimination of infected urethral glands, dilations of strictures, and transurethral resection of the bladder neck have given a high percentage of satisfactory results in more than 2,500 patients seen during the past 15 years.

The special electrode guide for use with the panendoscope used in this study was devised and supplied by Mr. Fred Wallace of American Cystoscope Makes, Inc.

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COMPLETE SYSTEM FOR ELECTROCARDIOGRAM PROCESSING APPLICABLE TO MECHANICAL SORTING

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Although many electrocardiogram coding systems are in use on a regional basis none has achieved national acceptance. It is obvious that if standardization of nomenclature and codes for diagnoses could be accomplished the transmission of electrocardiographic information would be greatly facilitated. This is especially clear when one considers the new electronic equipment which has become available to sort and classify information. Most of these machines must utilize digital systems for data processing. This communication describes a single, digital electrocardiogram coding system which lends itself to both manual and mechanical sorting. The use of mechanical sorting has become commonplace in many areas of industry and health, but a search of the literature fails to reveal the publication of such a digital system applicable to electrocardiogram coding. In fact, other than those systems contained

From the Heart Station and Department of Medicine, Ohio State University. Assistant Professor of Medicine, Ohio State University (Dr. Booth), Director of Cardio-Pulmonary Laboratory, St. Lukes Hospital (Dr. Hull). This study was done during the tenure of a Central Ohio Heart Association Fellowship (Dr. Booth).

The purpose of the system here described is to expedite the filing, recall, and study of electrocardiograms by the use of punch cards and a code. The three basic components of the system are a combination request, interpretation, and billing form, a standard punch card, and a four-digit code. The code supplies a number to match every possible electrocardiographic diagnosis. Since each punch card has 80 columns, there is room for 17 boxes of four digits each, to represent as many as 17 different diagnoses, in addition to necessary identifying data. Experience with the processing of more than 14,000 electrocardiograms showed that this system greatly increases the speed and ease with which records of individual patients are recalled or large numbers of records are studied for research purposes.

in standard textbooks,[1] publications dealing with coding methods of any type are notably absent from the current literature.

The System

The complete electrocardiogram processing system herein described consists essentially of three basic components, which will be described sequentially.

Combination Request, Interpretation, and Billing Form.—The combination request, interpretation, and billing form (fig. 1) is a three-piece, tear-away type form, with carbon backing over the name plate area on the first two sheets. The first sheet contains that information which will be of aid in the interpretation of the electrocardiogram, together with a box in the lower left-hand corner in which the appropriate code numbers of this particular electrocardiogram can be entered. The second sheet is used for sending the interpretation back to the hospital floor or the ordering physician, and the third sheet is used for billing purposes.

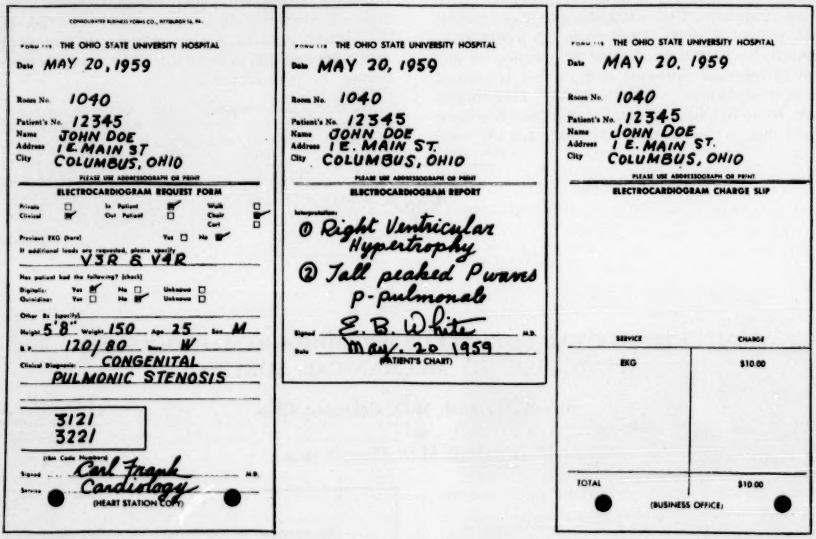

Fig. 1.—From left to right: pages one, two, and three of combination request, interpretation, and billing form of electrocardiogram coding system.

On receipt of a properly completed form an electrocardiogram is taken in the heart station. The complete electrocardiogram request form without the third or billing sheet is attached to the mounted electrocardiogram, together with an IBM code card (fig. 2), if the patient has had previous electrocardiograms taken. After interpretation of the electrocardiogram the diagnoses are written on the mount of the tracing together with the proper code numbers. These code numbers then are transcribed by the secretary to the box on the lower left-hand corner on the first of the three sheets of the request form. The interpretation is typed on the second sheet, and this is returned to the physician or the hospital floor. On the back of the IBM code card the date of the electrocardiogram is typed in together with the appropriate coded diagnoses, and the patient's name is typed on the front of the card. Next, the first sheet is sent to the IBM coding section with this new IBM code card or, if a previous electrocardiogram has been taken, a previously punched IBM code card. After the IBM punch operator enters the proper digits on the card it is returned to the secretary of the heart station and filed numerically in the current weekly file. The electrocardiogram is also filed by hospital or unit number. All electrocardiograms taken of one person are bound together, usually by a rubber band.

IBM Card.—The second part of the system consists of the IBM card itself (fig. 2), on the face of which the following columns for data have been imprinted: hospital number, race and sex, age, and 17 boxes of four digits each which include electrocardiographic diagnoses (table 1). The method used for coding race and sex is as follows: (1) white male, (2) white female, (3) nonwhite male, and (4) nonwhite female. Age is entered in columns 11 and 12. Although we have used the patient's age at

the time his first electrocardiogram was taken, entering the patient's year of birth might be preferable. Under our system the unit or hospital number is used throughout. If the patient has not had a previous number one is obtained from the record room. An auxiliary filing system for correlation of the patient's name, which is in alphabetical order, with the unit number would be optional. The current, punched IBM cards are kept in a separate drawer and taken down to the IBM section for merging at variable intervals, depending on the volume of tracings taken, but usually once a week. That is to say, they are placed in numerical sequence in their proper order in the master file. All IBM cards are kept in the heart station in special filing cabinets. When a new electrocardiogram is taken on a patient who has previously had one, this card is pulled out and attached to this latest electrocardiogram, so that all old diagnoses are immediately available. If a question arises the old electrocardiograms can then be pulled out without difficulty. It has been our practice to punch a single diagnosis only once, regardless of how many times this diagnosis recurs on subsequent electrocardiograms. In this way 17 separate diagnoses can be entered on one card, so that most patients have no more than one card on file. For example, if a patient's diagnosis is left ventricular hypertrophy, i. e., the retiring of old electrocardiograms to either microfilming or destruction, whichever seems appropriate. It has been our practice to retire these electrocardiograms after nine years, so that, for example, in 1961 all those electrocardiograms with a 2 appearing in column 80 would be pulled out and appropriate action taken. The cards would then be updated to the date of the next-to-the-oldest electrocardiogram taken on this person.

TABLE 1.—*IBM Card Data of Electrocardiogram Coding System*

IBM Columns	Information
1 through 8	Hospital number
9	Race and sex
11 and 12	Age
13 through 79	Electrocardiogram diagnoses
80	Retiring number

Four-Digit Code System.—The third part of the system is the four-digit code system (table 2). This system is divided into eight primary numbers, with secondary and tertiary subdivisions of these primary numbers. The fourth digit, in all cases, is a modifying digit; this is seen in the lower right-hand corner of the table and refers to the certainty of the diagnosis, to the presence of serial changes, and the like. Typical examples of electrocardiographic diag-

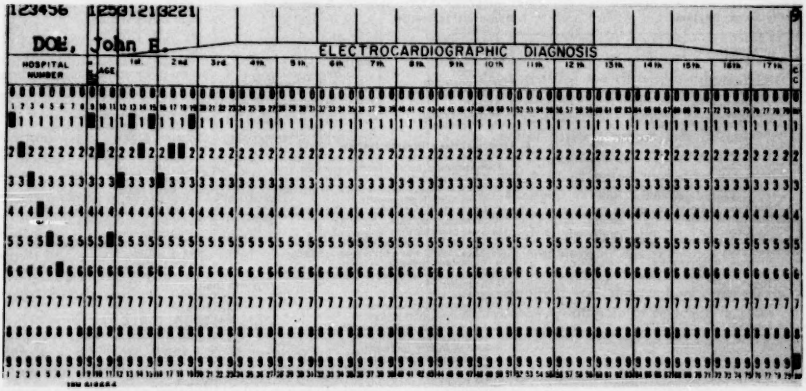

Fig. 2.—Punched and plate-imprinted IBM code card of electrocardiogram coding system.

3111, this digital series will appear on the IBM code card only once, no matter the number of electrocardiograms taken which have this same diagnosis. The mechanical sorter will always pull out this record on request. Special mention should also be made of column 80, in which we place the last digit of the year of the earliest electrocardiogram taken on a given person. For example, if the patient's first electrocardiogram was taken in 1952, a 2 could appear in column 80. This system has been devised for noses would be as follows: (1) definite atrial fibrillation, 2631; or (2) probable old anterior myocardial infarction, 5132. For most diagnoses this system is self-explanatory. Problems arise occasionally in the area of rhythms when, for example, one may have to code atrial tachycardia with constant 2:1 block. This is coded in the following manner: 2611; 4231. If a patient previously had an arrhythmia which now has reverted to normal sinus rhythm, the diagnosis of the arrhythmia is recorded

once more and a 5, indicating serial changes, is placed in the fourth digit. For example, for a patient with previous atrial fibrillation and a now normal sinus rhythm the code would be 2631 on the first electrocardiogram and 2635 on the subsequent electrocardiogram, showing normal sinus rhythm.

Comment.—The system here described, as previously noted, lends itself to both manual and mechanical sorting. Where manual use of this system is desired it is necessary to place the digits of the diagnoses on file cards. These could be filed alphabetically by name or numerically by unit number. It is also necessary to keep a master book, the pages of which are headed by the various digital diagnoses. It is on these pages that the unit numbers of the electrocardiograms falling under each given category next are written.

The mechanical sorting system in use at Ohio State University Hospital consists of the following four units: 1. An IBM card punch which enters the appropriate data on each card. 2. An IBM verifier which verifies the correctness of the punched information. 3. A 101 sorter. This instrument is capable of sorting 27,000 cards per hour and handling up to 12 characters on a single pass through the machine. 4. A collator which blends new cards into their proper numerical order in the master system and also indicates the presence of duplicate cards. Usually three passes of our cards are necessary to extract the desired information.

TABLE 2.—*Four-Digit IBM Electrocardiographic Code*

1. Normals, Sinus Mechanisms
1. Sinus rhythm
   1. Normal
   2. Sinus tachycardia
   3. Sinus bradycardia
   4. Sinus arrhythmia
   5. Normal infant
   6. Normal child
2. Sinus
   1. Arrest
   2. Premature systoles
   3. Wandering pacemaker
   4. Block (SA)
   5. Ventriculophasic sinus arrhythmia

2. Arrhythmias: Premature Systoles
1. Atrial
2. AV nodal
3. Supraventricular
4. Ventricular
5. Site unknown

1. Premature systoles (usual)
2. Coupled
3. Trigeminal
4. Interpolated
5. Multifocal
6. Fusion
7. Antegrade block (atrial or nodal) or retrograde conduction (ventricular)
8. Parasystole
9. Reentry

Arrhythmias: Rhythms
6. Atrial
7. AV nodal
8. Supraventricular
9. Ventricular

1. Tachycardia
2. Flutter
3. Fibrillation
4. Rhythm
5. Wandering pacemaker
6. Escape
7. Arrest
8. Retrograde AV block

0. Miscellaneous
   1. Reciprocal rhythm
   2. Abnormal rhythm, type undetermined
   3. Aberration of QRS
   4. Retrograde atrial conduction
   5. Mechanical stimulation of atrium

3. Ventricular Hypertrophy and P-Wave Abnormalities
1. Ventricular hypertrophy
   1. Left
   2. Right
   3. Combined
2. P waves
   1. Notched
   2. Peaked
   3. Broad

4. Conduction Abnormality
1. S-A
   1. Block
   2. Wenckebach
2. A-V
   1. Prolonged PR—constant
   2. Prolonged PR—inconstant
   3. Partial block—constant
   4. Partial block—inconstant
   5. Complete block with nodal rhythm
   6. Complete block with idioventricular rhythm
3. A-V
   1. Concealed conduction
   2. A-V dissociation (complete with atrial rate less than ventricular rate)
   3. Wenckebach phenomenon
   4. Dissociation with interference
   5. Accelerated A-V conduction
   6. Wolff-Parkinson-White syndrome
   7. Supernormal phase of conduction
   8. Capture
4. Intraventricular
   1. Incomplete right bundle-branch block
   2. Complete right bundle-branch block
   3. Incomplete left bundle-branch block
   4. Complete left bundle-branch block
   5. IV conduction defect, type undetermined
   6. Peri-infarction block
   7. Left intraventricular conduction defect (parietal block)

5. Myocardial Infarction
1. Anterior
2. Anteroseptal
3. Anterolateral
4. High-lateral
5. Posterior
6. High-posterior
7. Transeptal-posterior
8. Apical
9. Subendocardial
0. Posterolateral

1. Fresh
2. Recent
3. Old
4. Age undetermined

6. Abnormalities of Repolarization
1. ST-T wave changes
   1. Nonspecific (usual)—some of which may be due to digitalis
   2. Nonspecific (usual)—not due to digitalis
   3. Wide QRS-T angle only
   4. Borderline (not definitely abnormal)
   5. Secondary to rate
   6. Post-tachycardia
   7. Tall-peaked T waves—cause unknown
   8. Localized T-wave inversion—anterior
   9. Persistent juvenile pattern
2. Ischemia (symmetrical T-wave inversion)
   1. Anterior
   2. Posterior
3. ST segment displacement
   1. Subendocardial injury
   2. Epicardial injury (other than pericarditis)
   3. Site of injury unknown
   4. Ventricular aneurysm
   5. Definite displacement, probably not due to injury
4. Pericarditis
   1. Acute
   2. Subacute
   3. Chronic

7. Changes due to Drugs, Electrolytes, Inflammation, and Related Phenomena (U Wave)
1. Drugs
   1. Digitalis
   2. Quinidine
   3. Procainamide hydrochloride
   4. Other
2. Electrolyte imbalance
   1. Hypopotassemia
   2. Hyperpotassemia
   3. Hypocalcemia
   4. Hypercalcemia
   5. Other (combined, etc.)
3. Nonspecific (or cause uncertain)
   1. Prolonged electrical systole
   2. Prominent U wave
4. Myocarditis (myocardosis)
   1. Rheumatic
   2. Viral
   3. Other
   4. Unknown (e. g., Friedreich's)

8. Miscellaneous
1. Low voltage
   1. Limb leads only
   2. Precordial leads only
   3. Entire record
2. Exercise test
   1. Normal
   2. Abnormal
   3. Borderline
3. Positional
   1. Left axis deviation
   2. Right axis deviation
   3. Clockwise rotation
   4. Counter-clockwise rotation
   5. Dextrocardia
   6. Aberrant position (anatomic)
4. Changes secondary to pulmonary disease
   1. Consistent with cor pulmonale
   2. Consistent with pulmonary infarction
5. Other
   1. Electrical alternans
   2. Myocardial trauma (clinical)
   3. Terminal EKG
6. Dead
   1. Autopsy
   2. No autopsy
   3. Unknown
7. Special leads taken
   1. V3R & V4R (right precordial leads)
   2. Special V leads (left precordial)
   3. Extra leads for rhythm
   4. Esophageal leads
   5. With inspiration and expiration (III & aVF)
   6. Patient sitting up (III & aVF)

4th Digit
1. Definite
2. Probable
3. Possible
4. Serial changes
5. Transient, variable degree (I.V. conduction defect) intermittent, onset and/or offset
6. Changes as in 5 but due to special procedures
7. Unusual record from teaching standpoint

Summary and Conclusions

The system for processing electrocardiograms herein described has been in use at Ohio State University Hospital for almost two years, and over

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14,000 records have been processed. We have found it to be of definite value in the simplification of the routine handling of ordering, coding, and filing of electrocardiograms. In addition, it makes the recall of electrocardiograms for research purposes a simple and rapid process. For example, at present we have in our system some 14,000 coded electrocardiograms. All of these cards, which contain a specific diagnosis, a combination of various diagnoses, or information such as age by decade or other items, could be sorted in two to three hours and placed in numerical sequence for easy pulling of the filed tracings.

Considerable controversy rages at present over terminology with respect to electrocardiographic diagnoses. In practice, however, some rewording of the terminology would not interfere with use *in toto* of the described system—provided, of course, the code numbers were not changed. This complete system for the requesting, coding, filing, and recall of electrocardiograms lends itself to either mechanical or manual sorting processes.

Heart Station, Ohio State University Hospital (10) (Dr. Booth).

We wish to express our appreciation to Mrs. Jo Ann Martin, Miss Gloria Meeks, and Mr. Fred Shepard for technical assistance.

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THE CHRONIC ALCOHOLIC

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and
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Treatment for the chronic alcoholic, after a prolonged bout of alcohol ingestion, must attempt to correct the effects of alcohol on the central nervous system and gastrointestinal tract, the possible damage to the liver, and any existing malnutrition. The patient is best managed in the hospital, where complete control can be maintained during the period of withdrawal. Water, electrolytes, glucose, and vitamins are administered intravenously until the patient is able to eat. Understanding of the patient's dilemma rather than an attitude of rejection is necessary for rehabilitation.

The treatment of the alcoholic may be divided into two phases: first, the management of the patient immediately after a bout and, later, an effort to prevent his resuming the previous drinking pattern. The first phase of treatment is primarily medical and may constitute a medical emergency. The later efforts may be principally concerned with the emotional aspects of the patient's difficulties and are less somatic than psychiatric treatment.

This paper is primarily concerned with the correction of those changes which follow a prolonged period of an excessive intake of alcohol. The maintenance of sobriety after a bout of drinking will be briefly mentioned.

Metabolism of Alcohol

Alcohol has been used as a tranquilizing agent during the 5,000 years of recorded history and was known to produce tranquillity to the point of stupor long before man was aware that the phenothiazines had derivatives. It has been officially accepted as a medical problem, and it has been recommended by the American Medical Association that alcoholic patients be admitted to general hospitals without the barrier of diagnostic exclusion. The only one of the alcohols considered here is ethyl alcohol, since the others are too immediately toxic to present a great problem. Alcohol has been known to have both antiseptic and anesthetic properties for a number of years. In fact, it has been used by the British Army as an anesthetic, but there is little margin of safety in its use and it is ineffective in abolishing reflexes or producing a proper degree of muscle relaxation.[1]

Alcohol taken orally is absorbed unchanged from the stomach and the remainder of the gastrointestinal tract. The rate at which it is absorbed is influenced by several factors, including the presence of other substances in the stomach, since the absorption is particularly delayed by either fat or protein. Alcohol is most readily absorbed when concentration is between 10 and 35%, which, incidentally, is about the concentration of the average dry martini.

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After absorption, alcohol passes via the portal vein to the liver, on to the vena cava, to the heart and lungs, and then into the arterial circulation. Some delay is noted in the rise of the level of the cerebrospinal fluid and there is also a delay in the fall in the level in this medium. Alcohol is present, shortly, in all the tissues and in both intracellular and extracellular fluids. Alcohol is metabolized as a linear function of time but not of concentration, and about 1 oz. of whiskey is the maximum that can be metabolized in an hour. The maximum amount that can be metabolized daily is approximately 380 cc. of alcohol, the excess being circulated until it is metabolized. Ninety per cent of the alcohol is destroyed by oxidation, while the remaining 10% is excreted unchanged by renal, pulmonary, and cutaneous routes.

The oxidation of 1 Gm. of alcohol yields 7 calories, with carbon dioxide and water as the end-products. This process begins immediately on absorption and continues as long as any alcohol remains in the organism.

The liver is the primary site of oxidation of alcohol and the process has been studied extensively in vitro and in vivo.[2] Alcohol dehydrogenases are the enzymes responsible for the reaction and the coenzyme is diphosphopyridine nucleotide (DPN). During the metabolism of alcohol, blood entering and leaving the liver shows a rise in pyruvic and lactic acid levels which results in a mild acidosis. Removal of pyruvic acid and the accumulation of reduced DPN leads to a reduction in the citric acid cycle and a reduced reservoir of adenosinetriphosphate (ATP). This oxidation by dehydrogenation proceeds so rapidly that the hydrogen ion and electron acceptors are depleted and the ATP dependent reactions are slowed or temporarily halted. The conversion of acetaldehyde to acetic acid may take place in other organs and some excretion of this product in this form may occur. Once alcohol is transformed to acetic acid the reaction is universal throughout the tissues and becomes a part of the tricarboxylic acid (Krebs') cycle. The nonmetabolic excretion of alcohol is minimal and variable, but equilibrium between blood and alveolar air is the basis for clinical tests of intoxication.

Pharmacologically, alcohol acts as a depressant drug on the central nervous system; this depression proceeds as the concentration rises until eventually the vital centers are depressed. These effects on the central nervous system may result from the lipophilic action of alcohol, since molecules of this compound are oriented in lipid-containing membranes.[3] The apparent stimulation which results from a minimal intake of alcohol is actually due to the depression of the "higher centers" in which the ordinary acting inhibitions are relieved and the person is both euphoric and more spontaneous.

Alcohol has the following effects on other systems: the electroencephalogram is slowed; the respiration is not noticeably affected until high levels are reached; and the cardiovascular effects are minimal, although a moderate intake does produce a cutaneous vasodilatation with a sense of warmth. The dilating effects on the coronary arteries and the cerebral vessels are minimal. A 10% solution of alcohol produces an increase in both volume and acidity of the gastric contents. As the concentration of the alcohol rises, the secretion is inhibited. Higher concentrations of alcohol produce hyperemia and inflammation of the gastric mucosa and concentrations above 30% interfere with absorption. This also accounts for the "alcoholic gastritis" seen after an acute bout and is present in about one-third of those persons with chronic alcoholism. The intestinal changes seen are ordinarily due to substances other than the alcohol, such as irritating oils or other congeners. Alcohol taken to the point of intoxication produces a cessation of all gastrointestinal secretory and motor functions. The liver and pancreas are not affected by small amounts of alcohol. However, alcohol does produce a specific diuretic effect on the kidneys in the form of a water diuresis. For instance, 14 cc. of 86-proof whiskey produces a consistent water diuresis for two hours, with no change in sodium, potassium, or chloride concentration. This may be inhibited by pitressin and sodium chloride. This diuresis probably results from the action of alcohol on a supraoptic hypophysial system to inhibit the secretion of posterior pituitary antidiuretic hormone.[4]

Alcohol apparently has no effect on skeletal muscle, and the increased ability to work sometimes seen is probably the effect of the failure to perceive fatigue. Diplopia may result from poor muscular coordination and nystagmus may be due to a cerebellar effect, while emesis may result from both local and central nervous system effects.

General Effects

There is a decrease in the alkali-binding power of the blood, and alveolar hypoventilation produces carbon dioxide retention. The accumulation of lactic acid and acetic acid further diminish the alkali reserve. Since the acetaldehyde is metabolized slowly, the disturbance is prolonged and continues as one of the toxic factors after an acute bout of drinking.[2a]

In the hang-over, the headache may be due to both toxic and vascular effects, the vertigo is probably of central nervous system origin, and the nausea and emesis are caused by both central and peripheral effects. The hematological and electrolyte effects are those seen and expected as secondary to the accompanying dehydration.

The effects on cholesterol metabolism are interesting, since in most chronic alcoholics the cholesterol level is found at the lower limits of normal. The ingestion of alcohol produces no demonstrable change in the nonalcoholic drinker. The level of cholesterol esters is lowered in parenchymal liver damage, although cholesterol is more easily synthesized from acetic acid than from acetate substrates.[5]

The most consistent, frequent pathological change in persons with chronic alcoholism is in the liver. Leevy and others [6] found in the results of biopsies of the livers of 66 chronic alcoholics with delirium tremens that about one-third had a normal liver, another third had a fatty liver, and the final third had portal cirrhosis. He found no correlation between severity and duration of delirium tremens and histological changes, nor was there any correlation between the hepatic abnormalities and the amount or type of alcohol the person had drunk. There was a correlation between the liver changes and the dietary habits. He was not able to correlate the clinical signs with the anatomic findings, but he believed that alcohol caused an increased need for lipotropic substances and that the combination of alcoholism and dietary deficiency provided the proper substrate for the development of a fatty liver. It has been found that 75% of all alcoholics have fatty livers [7] and that only 9 out of 100,000 persons at large die from cirrhosis, whereas 650 out of 100,000 chronic alcoholics die of cirrhosis.[8]

Patients with liver insufficiency have been found to have a significant reduction in cerebral oxygen consumption in spite of the fact that there are no evident neurological signs.[2a] Mild inebriation produces no effects on cerebral blood flow, metabolism, or vascular resistance if there is no concurrent liver disease.

Leevy [6a] found that fatty livers were most marked in patients on carbohydrate diets lacking in lipotropic factors, but hepatomegaly was a finding observed in 80% of patients. Anorexia, nausea, vomiting, diarrhea, capillary dilatation, loss of weight, malnutrition, cachexia, personality changes, delirium tremens, mental and moral deterioration, cirrhosis, pellagra, polyneuritis, optic atrophy, psychoses, and multiple related organic disorders due to lowered vitality and resistance are some of the varied signs and symptoms of the chronic alcoholic. Most of these problems are not encountered in the chronic alcoholic whose food consumption and assimilation are adequate, but this is not often the case. The calories supplied by the alcohol diminish the food intake as well as the appetite. A heavy drinker may supply one-half of his total calories in alcohol and this may continue for many years. The above-named deficiency diseases, a lowered resistance to infection, and susceptibility to trauma may occur with increasing frequency in the chronic alcoholic.

The experimental production of the fatty liver has yielded some pertinent facts. A deficiency of methyl group donors (choline, betaine, B_{12}, folic acid, citrovarum factor) will produce a fatty liver with later development of cirrhosis.[9] Necrosis of the liver with widespread hepatic parenchymal degeneration is produced by a deficiency of amino acids (cystine, selenium, methionine, vitamin E). In the production of either fatty liver or hepatic necrosis, the greater the caloric intake the greater the effect of the vitamin deficiency. Alcohol provides an excess of calories which causes an imbalance between calories and proteins or lipotropic substances, and thus serves to intensify the deficiency already existing.

The problem of hepatic coma has presented an interesting paradox in the treatment of the chronic alcoholic. It has been observed that chronic alcoholics who are given ammonium-containing medicaments (NH_4Cl, urea, resins) soon develop mental confusion and a "flapping" tremor.[10] These changes are reversible on discontinuance of the medication. The same phenomenon was observed in animals with an Eck fistula who were given high-protein diets, and subsequently it has been demonstrated that blood ammonia levels above normal range (40 to 60 mg.%) occur in persons with these cerebral abnormalities.[11] In certain critical situations, the intestinal flora may produce enough ammonium to cause coma-like symptoms, and hence the improvement observed after administration of broad-spectrum antibiotics. Attempts to correct the problem of hepatic coma have consisted of giving glutamic acid (to combine with the excess ammonia as glutamine) and arginine (to act as a precursor of ornithine in priming the Krebs-Hensleit urea cycle).[12] Patients with reversible hepatic coma have been treated by both of these methods, with some success. The physician who treats this form of liver failure must recognize the contradictory problems raised by the intolerance for proteins and the need for protein realimentation. During the last stages of liver failure, protein is virtually lethal, hence it must be determined at which point small amounts of protein may be given with sufficient nonprotein calories to spare immediate deamination of this material. With proper management, hypoproteinemia, ascites, and edema may improve. The tolerance for amino acids and for glucose may return toward normal, and the metabolism of galactose, bile pigments, steroids, and thyroid may be improved.

Treatment

The alcoholic is most often seen by the physician at the termination of a prolonged bout of drinking. He is usually in an extremely toxic condition, dehydrated, and may or may not be in a state of delirium. The immediate problem is the restoration of the patient to as near a physiologically normal state as is possible by the correction of his dietary deficiencies and dehydration and to substitute another medicament for the depressing drug, alcohol, which he can no longer tolerate.

There are two reasons for immediately discontinuing alcohol in such a patient; the first being the toxic effect of this substance on his already damaged liver and second the increased psychological dependence on the drug from its medical use.

The patient as first seen is a pitiful sight. It is at this point that the physician must exert all possible control over himself to avoid an instinctive feeling of superiority over the patient. This is probably the greatest barrier to successful treatment

of an alcoholic patient and is one which is unconsciously assumed by the physician at the first visit. The patient is frightened, depressed, weak, restless, and unable to sleep. He has a tremor made worse by intention. The problem of hallucinosis and delirium tremens may also be present. On physical examination, he shows some increase in tendon reflexes and clonus may be observed. The pulse rate is increased and systolic and diastolic blood pressure may be elevated. There is a warm skin with some peripheral vasodilatation, and body temperature may be 99 F (37.2 C) or 100 F (37.8 C). The evidence of dehydration is present, as the diuretic action of alcohol has been active. The mouth is dry, the eyes are sunken, and the skin is wrinkled. Hematocrit values of 40 to 50% may be present, and this usually reflects a hemoconcentration without electrolyte disturbance. The alcoholic after a binge is usually starving as well, since most have lost weight and have nausea, vomiting, and diarrhea.

The correction of these physiological abnormalities is basically the responsibility of the family physician, and can and should be accomplished in the community general hospital. Fluid restoration is the primary aim, and 1,000 cc. of 5% dextrose in physiological saline solution followed by 1,000 cc. of 10% dextrose in distilled water should be given, together with parenteral administration of vitamin B complex and vitamin C, in the first two hours. Chlorpromazine (Thorazine) hydrochloride or promazine (Sparine) hydrochloride should be given intramuscularly at the onset and repeated in three or four hours. Subsequently, this should be given by mouth in divided doses. Mephobarbital (Mebaral) should be given by mouth concurrently. As soon as the nausea and vomiting have subsided, orally given fluids should be offered at frequent intervals, and food should be added as soon as it can be tolerated. Godfrey [4a] reports that on this regimen the hallucinations are gone and that convulsions no longer occur within 24 hours. He further states that on this regimen no patient has developed delirium tremens. Should this condition supervene, the continued administration of the above drugs and fluids is indicated, and on occasion it may be necessary to use corticotropin in doses of 25 mg. parenterally every four to six hours. In general, the other complications will subside with this method unless, for example, the gastritis is further complicated by bleeding esophageal varices, in which case a mechanical approach to the source of blood loss must be made.

In caring for the alcoholic after he regains sobriety, the family physician has a tremendous responsibility. He must treat a patient who does not admit his own disease and who usually shows little or no motivation for maintenance of the sober state. Rehabilitation can be accomplished if the physician is quick to sense the prodromal signs of an oncoming bout and, above all, if he, by his own attitude, can show the patient that he believes this is an illness worthy of continuing medical care and does not allow any personal prejudice against the "stigma" of alcoholism to be demonstrated. The use of drugs in the maintenance of the sober state is usually limited to larger medical centers, since the conditioned reflex type of withdrawal therapy needs occasional reinforcement. The use of disulfiram (Antabuse) has a definite place in effective withdrawal in certain persons and in certain institutions, but this requires the cooperation of the patient to the extent that he must take the medicament daily. If he loses the desire to do this, within 72 hours the drug will have been excreted, and he is then free to drink alcohol without physiological consequences.

Perhaps the single most effective force is the psychotherapeutic one, which offers the alcoholic many facets of refuge. The understanding physician who can treat and not reproach; the understanding wife and family who can accept the patient without reprehension; the community which can do likewise; and, above all, the local chapter of Alcoholics Anonymous are all a part of effective rehabilitation.

Summary

The medical management of the chronic alcoholic involves a knowledge of the effects of long-term consumption of alcoholic beverages, including the metabolic pathways involved. The rehabilitation of an alcoholic patient is long and tedious, since it involves an illness which has been present for some time and one in which motivation for recovery is poor. The family physician in the home community is best equipped to accomplish this rehabilitation.

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DETECTION OF HEPATITIS CARRIERS BY SERUM GLUTAMIC OXALACETIC TRANSAMINASE ACTIVITY

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The prevention of homologous serum hepatitis (HSH) after transfusions depends on improved methods of detecting latent hepatitis among prospective donors. In a series of 1,371 recipients adequately followed up, 39 developed HSH. When the donor bloods were classified according to their serum glutamic oxalacetic acid transaminase (SGO-T) values, it was found that the incidence of HSH was only 1.5% among recipients of blood with normal SGO-T values while the corresponding figure was 5.5% for SGO-T values above 100 units. Since the differences were statistically significant, it appeared that SGO-T determinations would be more useful than most or all of the tests currently used for screening out hepatitis carriers among prospective blood donors.

The reported incidence of homologous serum hepatitis subsequent to blood transfussion is 0.3 to 1.9% in civilian hospitals [1] but was as high as 3.6% in soldiers given blood transfusions in the Korean theater of war.[2] By contrast, infectious hepatitis has a reported incidence of about 0.02%.[1b] An estimated 5 million transfusions are given in the United States each year,[3] and, although the total incidence of homologous serum hepatitis is not precisely known, on the basis of the above reports 15,000 to 100,000 cases of homologous serum hepatitis can be expected to develop each year. These patients are, as a rule, out of work for an average of six weeks and 1 to 5% will die.[4]

The precaution of refusing blood donations from persons who have a history of jaundice or of a recent upper respiratory infection cannot be expected to decrease significantly the occurrence of homologous serum hepatitis, since donors may be asymptomatic during the incubation period of hepatitis or may be infected with a subclinical or anicteric form of the disease.

The incidence of hepatitis carriers among the general population has been estimated to be 0.5 to 6%.[5] No specific bacteriological, immunological, or laboratory methods have yet been developed which will detect the presence of the virus of infectious hepatitis among blood donors. Determinations of thymol turbidity, cephalin flocculation reaction, urobilinogen level, zinc turbidity, and sulfobromophthalein (Bromsulphalein) retention have proved ineffective for screening hepatitis carriers.[6] This is not suprising, since the results of these tests are far from specific and may frequently be within normal limits during the incubation period of infectious hepatitis or in patients with subclinical or anicteric viral hepatitis.

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The activity of the enzymes serum glutamic oxalacetic acid transaminase (SGO-T) and serum glutamic pyruvic acid transaminase increases early and significantly in both homologous serum hepatitis and infectious hepatitis. For example, inmates in a closed institution who were exposed to infectious hepatitis were found to have increased enzyme activity for a few days to 12 weeks before the onset of jaundice. Furthermore, only those inmates whose SGO-T level became elevated subsequently developed hepatitis.[7]

If, as appears likely from the above findings, an increase in SGO-T activity is the first evidence of impending infectious hepatitis, it can be assumed that increased enzyme activity in donors might be a useful screening test to eliminate hepatitis carriers.

Materials and Methods

All donor bloods received in the blood bank of the Memorial Center between Dec. 20, 1955, and Jan. 1, 1957, a total of 14,296, were analyzed for SGO-T activity. The blood came from three different sources: a commercial blood bank, the Red Cross, and the Memorial Center blood bank. The latter blood was donated by friends and relatives of hospitalized patients. When possible, the bloods were tested one to seven days after they were received. In case of accumulation due to excessive influx, the serums were refrigerated and then tested at a later date.

TABLE 1.—*Incidence of Abnormal SGO-T Activity in Blood from Various Sources*

Source	No. of Donor Bloods Tested	SGO-T <40 Units No.	%	SGO-T,41-50 Units No.	%	SGO-T,51-100 Units No.	%	SGO-T>100 Units No.	%
Commercial blood bank	7,385	1,639	22.2	613	8.3	844	11.4	182	2.5
Memorial Center	2,144*	265	12.4	102	4.8	137	6.4	26	1.2
Red Cross	3,739	1,178	31.5	418	11.1	648	18.3	76	2.0
Total tested	13,266	3,082	23.2	1,133	8.5	1,665	12.5	284	2.1
Not tested	1,030								

SGO-T activity was determined spectrophotometrically *; 40 units was considered the upper limit of normal. When hemolysis was visible but slight, values below 50 were considered normal. When excessive hemolysis was found, the blood was considered unsuitable for enzyme determination and therefore discarded for the purposes of this study.

Our facilities were insufficient for a follow-up of all of the 4,240 recipients of the 13,266 bloods tested. Of these recipients 2,857 were followed up either in our outpatient service or at home. In the latter instance information was obtained from post cards sent regularly for the first seven months after the patients had received their last blood transfusions. Patients who died within the first three months after receiving their last blood transfusion were not included in this study. None of these patients developed unequivocal hepatitis before death, and, while they might or might not have developed the disease if they had lived long enough, they could not be included in the statistical evaluation. The total number of patients who died within three months was 862, leaving 1,995 recipients for study. Of these 1,995 patients, 624 failed to answer the post cards. Adequate information for the six-month period after transfusion was thus available in 1,371 cases.

Blood transfusions were given to the patients before the results of the SGO-T determinations were known, so that two groups of recipients were formed: (1) a group numbering 603 that received only "normal blood" and (2) 768 recipients of one or more transfusions of "abnormal blood." However, patients in the latter group may or may not have received one or more normal transfusions. Some patients who developed jaundice were admitted to the Memorial Center for further study of the cause of jaundice; others were treated by their own physicians, who supplied the pertinent clinical and laboratory data to us. In the latter group it was often, but not always, possible to obtain serum for enzyme analysis and liver function studies.

All patients with hepatitis who had received blood transfusions during any previous admissions to other hospitals within the last year were excluded from the tabulation. The only patients included were those in whom the symptoms, signs, and course of the disease, as well as the result of the biochemical tests of liver function and enzyme studies, were characteristic of hepatitis. Patients in whom other diseases of the liver were suspected as the cause of jaundice were excluded.

Results

Table 1 shows the percentage of abnormal donor bloods from the commercial blood bank, the Memorial Center, and the Red Cross separated into ranges of SGO-T activity of from 41 to 50 units, 51 to 100 units, and above 100 units respectively. The donors from the commercial and Red Cross blood banks had approximately twice the incidence of elevated SGO-T activity of the donors from the Memorial Center blood bank. Although most elevations of SGO-T fell between 41 and 100 units, more than 2% of all donors tested showed highly abnormal values of more than 100 units. The incidence of abnormal values among the commercial and Red Cross donors was again found to be about twice as high as among donors from the Memorial Center.

The over-all incidence of abnormal values of SGO-T activity among 13,266 donor bloods tested reached an unexpected high of 23.2%. In this large series of apparently normal persons, it was found that nearly one out of four had SGO-T activity exceeding the generally accepted upper limit of normal of 40 units. This high incidence of abnormal SGO-T activity among the blood donors was, in part, due to the manner of handling the blood samples sent to the laboratory. Bloods from the Red Cross and commercial source had pilot tubes containing both blood cells and serum, unseparated, up to two to three weeks before being used. The bloods drawn from the Memorial Center were almost always promptly processed so that blood cells and serum were separated within one to three days.

TABLE 2.—*Variations in SGO-T Activity with Delayed Separation of Serum and Red Blood Cells in Donated Bloods*

SGO-T Units	Group 1 (100 Bloods) Immediately Separated	Group 2 (50 Bloods) First Analysis After 5 Min., No.	Group 2 (50 Bloods) Second Analysis After 2 Wk., No.
40	92	43	27
41-50	2	1	8
51-100	5	5	12
>100	1	1	3
Abnormal SGO-T*	8%	14%	46%

* Forty units considered upper limit of normal; when hemolysis visible but slight, values below 50 considered normal.

The following experiment demonstrates the effect of delayed separation of serum and red blood cells upon the level of SGO-T activity. SGO-T activity was determined in 150 donor bloods immediately after withdrawal. The blood cells and serum were separated immediately in 100 bloods (group 1), while aliquots of serum were withdrawn and analyzed after contact with red blood cells for five minutes and again after two weeks for 50 bloods (group 2). Table 2 shows the results of this experiment. When analyzed immediately after withdrawal, abnormal SGO-T levels were found in 9.3% of the entire group of 150 bloods. Fourteen per cent of the 50 bloods tested twice showed abnormal SGO-T levels on the first analysis immediately after withdrawal. On the second analysis, 23 (46%) of these serums, after two weeks' contact with the red blood cells at 4 C, showed an SGO-T level exceeding the upper limit of normal of 40 units. In 49 of the 50 samples the SGO-T activity was seen to increase from the first to the second test two weeks later. The increment in SGO-T activity after standing averaged 39.7% for the whole group.

The total number of cases of hepatitis in the 1,371 recipients studied for six months was 39. Nineteen of these were followed up at the Memorial Center while 20 were treated either by their own physicians or in other hospitals. The incubation period was less than six weeks in 9 and more than six weeks in 30 patients. In table 3 the number of cases of hepatitis developing within and after an incubation period of six weeks is expressed in percentages of the total number in each of three groups of recipients: (1) those given transfusions with an SGO-T level below 41 units; (2) those receiving one or more bloods with a level of activity between 41 and 100 units; and (3) those given one or more transfusions with an SGO-T level above 100 units. The total incidence of hepatitis in the group that had received blood with a level

TABLE 3.—*Incidence of Hepatitis in Recipients of Tested Donor Bloods*

	Total No. of Recipients	SGO-T <41 Units		SGO-T 41-99 Units		SGO-T >100 Units		Total No. of Bloods with Abnormal SGO-T Activity	
		No.	%	No.	%	No.	%	No.	%
Cases of hepatitis	9	1.5	22	3.5	8	5.5	30	3.9	
Incubation period more than 6 wk.	6	1	18	2.9	6	4.2	24	3.1	
Incubation period less than 6 wk.	3	.5	4	.6	2	1.3	6	.8	

of SGO-T above 40 units is twice as high as in the group that received blood with normal SGO-T activity. In the group that received blood with an SGO-T level above 100 units, the incidence of hepatitis was three times as high as in the group that received only normal blood. When the cases with an incubation period of less than six weeks are subtracted, the percentages are found to be 1% for the group that received normal blood, 3.1% for the total group receiving abnormal blood, and 4.2% for recipients of blood with more than 100 units of SGO-T activity. The difference for both groups is statistically significant, with probability factors of 0.05 and 0.03 respectively.

Comment

The present data show that a significantly higher incidence of viral hepatitis is found among a group of recipients of blood with abnormal SGO-T activity than in a group that received blood with an SGO-T level of 40 units or less. The unexpected finding of a 23% incidence of abnormal SGO-T activity among the tested blood donors is partly an artifact which, statistically, does not materially weaken the significance of the results.

TABLE 4.—*Probability of Contracting Hepatitis from Blood Transfusions with Various SGO-T Levels*

	No. of Transfusions Administered				
Recipients	SGO-T	≤40 Units	41-100 Units	>100 Units	Hepatitis Frequency	Best Estimate of Probability
Group 1 ..	1,391		0	0	8/1,391	0.0058
Group 2 ..	851		1,084	0	19/1,935	0.0098 p SGO-T 41-100: 0.0130*
Group 3 ..		339		128	6/467	0.0128 p SGO-T >100: 0.0200†

* Probability of contracting hepatitis from one transfusion with SGO-T activity 41-100. Calculation: 851 at p 0.0058—4.94 cases of hepatitis. Balance: 14.06/1,084—p: 0.0130.

† Probability of contracting hepatitis from one transfusion with SGO-T activity of >100 units. Calculation: 339 at p 0.0098—3.32 cases of hepatitis. Balance: 2.68/128—p: 0.0209.

The experiments performed after completion of the study demonstrated an over-all incidence of abnormal SGO-T activity of 9.3% among 150 bloods tested immediately after withdrawal, as compared with 46% in 50 serums left in contact with the red blood cells for 5 to 21 days before testing. The first percentage is of the same magnitude as that found among the donors of the Memorial Center blood bank, while the second figure approximates more closely that found among bloods received from the commercial and the Red Cross blood banks.

The group of recipients followed up in this series is not ideal for study, since it is composed mainly of patients with neoplastic diseases undergoing major surgery, who received multiple injections and infusions of blood during their hospital stay. Difficulty in establishing a correct diagnosis and in eliminating epidemiologic mechanisms other than blood transfusions may, to a certain extent, weaken the conclusions of a study of this kind. Chance of contamination was minimized by the use of disposable needles, syringes, and infusion equipment. From the statistical viewpoint it is objectionable that the recipients studied usually received multiple blood transfusions and that normal and abnormal transfusions were given in varying numbers in all cases.

The data were, therefore, reanalyzed statistically; both the total number of transfusions and the ratios of bloods with SGO-T activities below 40,

between 41 and 100, and above 100 units given to each recipient were taken into account. In this calculation only patients receiving 1 to 10 transfusions were analyzed, so that the number of cases of hepatitis taken into account was reduced to 35. Table 4 summarized the results of this analysis. The best estimate of p, that is, the probability of getting hepatitis from blood transfusions with various SGO-T levels, was calculated for each of these three groups of recipients. Table 4 expresses in different terms that the probability of getting hepatitis exists for 1 out of 173 recipients given one blood transfusion with an SGO-T level of less than 40 units, 1 out of 77 persons receiving one transfusion with an SGO-T activity of 41 to 100 units, and 1 out of 47 persons receiving one transfusion with an SGO-T level greater than 100 units. The differences between these three groups are statistically significant.

The original purpose of the present study was to establish whether any consistent relationship exists between infectivity of viral hepatitis and elevated transaminase activity in the donor population. The results indicate that the SGO-T test is a more useful method for detecting silent carriers of hepatitis virus than other tests of liver function previously evaluated in this context. This is true irrespective of whether donors are at some stage of the incubation period of viral hepatitis or have asymptomatic, anicteric, or subclinical viral hepatitis. These latter difficulties and unpredictable variables do not permit us, on the basis of this study, to draw definite conclusions about the advisability of discarding bloods with abnormal SGO-T activity. However, it is felt that the present results warrant further studies to elucidate whether an abnormal SGO-T activity reflects the presence of hepatitis virus in donor bloods in a sufficiently high percentage of cases to advocate the determination of SGO-T activity as a standard screening measure to be used by the blood banks to minimize the occurrence of homologous serum hepatitis.

Summary

Thirteen thousand two hundred sixty-six donor bloods were tested for serum glutamic oxalacetic acid transaminase (SGO-T) activity in an effort to evaluate the importance of subclinical hepatitis or "the carrier state" in the production of homologous serum hepatitis in the recipients of these transfusions. The significant findings were as follows: 1. One thousand three hundred seventy-one recipients of blood transfusions were adequately followed up for six months, and 39 (2.8%) of these developed homologous serum hepatitis. 2. Six hundred three of these patients were given blood with normal SGO-T activity, and nine (1.5%) developed hepatitis. 3. Another six hundred twenty-four of the patients followed up were given blood with an SGO-T activity of 41 to 99 units, and 22 (3.5%) developed hepatitis. 4. One hundred forty-four of the recipients followed up got blood with an SGO-T activity above 100 units, with a subsequent 5.5% incidence of hepatitis. 5. If transfusions had been restricted to the administration of donor blood with a SGO-T activity of 40 units or less, 9 rather than 39 cases of hepatitis among the 1,371 recipients studied would have been found. 6. It was calculated that the incidence of hepatitis from one blood transfusion with an SGO-T activity of less than 40 units was 0.0058; for one transfusion with an SGO-T activity of 41 to 99 units 0.0130, and for one transfusion of blood with an SGO-T level of 100 or more units 0.0209. These differences are statistically significant.

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CLINICAL NOTES

FOREIGN BODY (DRINKING GLASS) IN THE RECTUM

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Foreign bodies in the rectum are frequently reported in the surgical literature. Objects are often inserted accidentally. At other times they are deliberately inserted, and the question as to what prompts persons to do this is a moot one. Frequently, these foreign bodies inserted through the anus are the result of prankish debauches and practical jokes. Sometimes they are inserted for the purpose of sexual deviation, and slip beyond the grasp of the user. Often they are inserted by the psychotic person with no actual or apparent intent or purpose.

Unless it can be established that the presence of a foreign body in the rectum is the result of an accidental insertion, it is frequently difficult to evoke a satisfactory history from these patients as to the reason for its presence. This is understandable, as embarrassment often inhibits them from revealing the reasons for their deliberate act and their consequent predicament.

Macht [1] reported the removal of a small beverage bottle from a patient's rectum. In reviewing the literature, he found such objects reported in the rectum as a snuff box, a whisky glass, a 30-cm. mortar pestle, a cold cream jar, a lemon, an apple, chicken bones, a glass tube, portions of a broom handle, and a frozen pig's tail. Glendon [2] removed a jelly glass from the rectum by laparotomy; Gillespie [3] removed a petrolatum (Vaseline) bottle, Pretty [4] removed an ink bottle, and Scamahorn [5] removed a flashlight, rectally. Kleitsch [6] reported a patient who, after giving himself an enema with a colon tube, with unsatisfactory results, used an umbrella handle to break up what he thought was a fecal impaction. He was then unable to remove either the umbrella handle or the colon tube, which had become firmly held in place by a rectal spasm. Kleitsch removed the umbrella handle by traction and the colon tube was then ejected spontaneously.

As a rule, rectal examination will detect foreign bodies in the rectum. Occasionally, however, the foreign bodies migrate into the sigmoid or high within the abdominal cavity and may be unrecognized during rectal examination. One of us and Martin [7] reported an unusual case of surgical removal of a 9-in. case knife from the sigmoid of a patient whose complaint on admittance was "knife-like" pain in the region of the umbilicus. Rectal examination of this patient was negative.

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Methods of Removal

Numerous ingenious devices have been used to remove foreign bodies rectally. Ball [8] removed an antiseptic solution (Listerine) bottle by this method, with a loop made from a wire coat hanger. Light bulbs have been removed by use of two spoons, one on either side, as "forceps." Bacon [9] removed a glass by filling the open end with plaster and inserting forceps into the plaster for a handle. With the open end toward the peritoneal reflection, a hole was drilled into the base, thus giving a site to which to apply traction. McLean and Smathers [10] reported the removal of a glass by introduction of lubricated tongue blades between the mucosa and the glass, with division of the anus in the posterior midline. Others have described grasping a glass with rubber-shod forceps over gauze, so as not to fragment it.

Surgical removal of foreign bodies from the rectum by laparotomy, either by opening the colon or by directing the foreign body downward toward the anus, is necessary in some instances.

Mortality

The mortality in patients with foreign bodies in the rectum, removed either rectally or surgically, remained prohibitively high for some time prior to the introduction of drugs to cleanse the colon and antibiotics to prevent or overcome infection. While laparotomy alone results in a low mortality, it is, however, axiomatic that the mortality is increased when the colon is opened for surgical removal of a foreign body. However, with the recent advances in chemotherapy and antibiotics, this potential has also been greatly diminished.

Nevertheless, occasional deaths are reported after removal of foreign bodies from the rectum, and in some patients death is due to various physiological complications unrelated to attempts at removal. For example, Holcombe [11] reported a patient who had used an uncovered tennis ball to replace hemorrhoids, the ball having been pushed through the rectum beyond reach. The patient died before

operation for removal could be carried out. Postmortem examination three hours later revealed the abdomen to be full of fluid and fecal content. When removed, the ball was surrounded by omentum, indicating that it had been lying free in the abdominal cavity for some time. Death, according to Holcombe, was apparently due to a combination of distention and pressure necrosis leading to rupture.

We are reporting a case of a psychotic patient who was found on examination to have a sharp and jagged-edged drinking glass in the rectum. Because of the fact that there were no presenting symptoms and no specific complaints, except for the patient's claim of the presence of a glass in his rectum, which he insisted had been there for two years, it was thought that a report of the case would be of interest. Factors leading to surgical removal of the glass are described.

Report of a Case

A 37-year-old man was admitted to Cook County Hospital Oct. 16, 1958, with the complaint of a broken glass in the rectum. The patient was brought to the hospital by members of his family, who stated that he was psychotic. This was borne out by the fact that the patient himself, who spoke only broken Lithuanian, said very little and, when he did

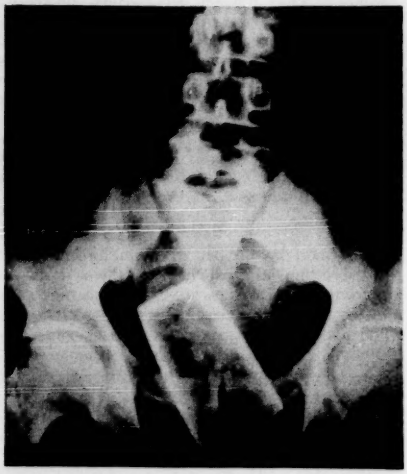

Fig. 1.—Position of drinking glass in rectum.

speak, was completely incoherent. He had no complaints other than the presence of the misplaced drinking glass.

Physical examination revealed that the patient was well developed and was not in distress. Blood pressure was 140/90 mm. Hg, pulse 92 per minute, temperature 98.6 F (37 C), and respiration 16 per minute. Rectal examination revealed a glass at the tip of the examining finger. It was lying with the open end downward, and the edges were sharp and jagged. The glass was filled with firm, impacted feces. There was poor sphincter tone. A proctoscope

Fig. 2.—Jagged-edged drinking glass removed from rectum.

was readily passed up to 12 cm. After cleansing and oil enemas were used to remove the impacted feces, the proctoscope could be passed to the base of the glass.

On Oct. 18, 1958, with use of spinal anesthesia, an attempt was made to remove the glass rectally. The open jagged edges of the glass engaged on the sacral prominence and lacerated the mucosa. It was evident that removal from below could not be achieved without causing marked trauma to the mucosa and sphincter. A roentgenogram was then made, and revealed the position of the glass (fig. 1).

Surgery was decided on, and the patient was given 2 Gm. of neomycin orally during the next 24 hours, and the intestine was cleansed with enemas. At operation a left paramedian incision was made, the dilated rectosigmoid exposed, and a longitudinal incision made. The glass was easily removed, and the colotomy was closed transversely with 000

chromic catgut and 0000 black silk. The peritoneum and anterior sheath were closed with one layer of no. 32 steel wire, and the skin was closed with fine wire. The glass is shown in figure 2. The patient's recovery was uneventful, and he was discharged on the ninth postoperative day.

Summary

A foreign body, in the form of a sharp, jagged-edged drinking glass, lying open end downward, was found in the rectum of a psychotic patient. An attempt was made to recover the glass rectally. However, it was found advisable to remove the broken glass by laparotomy, rather than to traumatize the rectal mucosa and sphincter by rectal removal. Cleansing the colon with neomycin, and with enemas when possible, greatly diminishes the morbidity and mortality associated with laparotomy for removal of a foreign body in the rectum.

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PSYCHOTHERAPY OF AN INFANT WITH RUMINATION

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Insufficient attention is given to the observation that infants can have psychiatric disorders. The infant is emotionally responsive and can react within the limits of his expressive capabilities with anxiety. From birth, disturbed behavior may occur as a somatic disorder, arrest of motor and behavioral maturation, and regression. Since the range of behavior in an infant is limited as compared to older children and adults, psychiatric disturbances in infancy have a greater tendency to be expressed as somatic complaints. Moreover, the etiology and management are intimately related to the mother. For a long time, the infant continues to be helpless and dependent on his mother and he is very much a unit with her, reflecting her emotional reactions and disturbances. An emotionally stable mother serves her infant's needs better than does an emotionally disturbed mother. Psychiatric treatment of an infant must involve the mother as an integral part of the baby. When the mother cannot be involved directly in treatment, a mother-surrogate must be supplied, since an infant cannot progress without a mother-child interrelationship. The following case report demonstrates how psychiatric emphasis in the management of an infant with severe rumination was probably lifesaving.

The syndrome of rumination has been well described by several authors recently.[1] In brief, rumination is the active, voluntary return of swallowed food to the mouth. This food may be partially or completely reswallowed or expelled. In some instances, the rumination may lead to progressive malnutrition. It differs from regurgitation, which is more involuntary, in that purposeful, preliminary movements of the mouth and tongue occur, and, on successful completion, an expression of gratification appears in the face.

The age of onset varies from 5 weeks to 12 months.[2] There seems to be no race or sex predisposition. The severity is variable, with a mortality up to 20% reported in the past [3]; this figure is probably lower at present. An organic cause for this syndrome is usually not found, and recently the psychiatric aspects have been stressed.[4]

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Report of a Case

History.—An 8-month-old boy was admitted to the pediatric service of the Mount Sinai Hospital on Nov. 14, 1958, because of malnutrition, inability to retain food, and a 1,000-Gm. (2¼-lb.) weight loss in the two months prior to admission. The mother's pregnancy had been complicated by mild toxemia during the last trimester. Birth had been by delivery at home at term, with no physician in attendance. The infant's birth weight was 3,400 Gm. (7½ lb.). For the first six months of life, growth and development were normal. He received vitamin supplementation and had begun on a schedule of immunization. At 6 months of age, with no prior feeding difficulties, he weighed slightly more than 7,000 Gm. (16 lb.). At this time, he was seen in the Mount Sinai pediatric clinic for a rash ascribed to orange-juice or pear-juice allergy. With elimination of these juices, substitution of a soybean milk for cow's milk, and local therapy, the rash gradually cleared during the next month. Shortly thereafter, the child began to regurgitate his feedings, in spite of a good appetite. This was not affected by his position; solids and liquids dribbled out of his mouth without force within a few minutes after feeding. He was seen twice during the next month; a hemogram revealed mild hypochromic microcytic anemia, and wrist x-rays showed no bone-age retardation or rickets. Anticholinergic and sedative medication before feedings failed to alter the pattern of regurgitation.

Physical Examination.—On admission, the infant was markedly wasted, appeared chronically ill, and had an unhappy expression. Temperature was normal, pulse 120 beats per minute, head circumference 17.5 in. (44 cm.), chest circumference 15.5 in. (39 cm.), length 25 in. (64 cm.), and crown-to-pubis length 16 in. (41 cm.); respirations were 30 per minute. There was general malnutrition and some shotty anterior and posterior cervical lymphadenopathy; otherwise, physical examination was within normal limits.

Laboratory Data.—A hemogram showed moderate hypochromic anemia, with normal white blood cell and differential counts. Results of a test with a sickle-cell preparation and urinalysis were normal. Skin tests to purified protein derivatives, serum electrolyte and blood urea nitrogen determinations, nose and throat cultures, and lumbar puncture were noncontributory. An electroencephalogram was within normal limits, as were skull and chest x-rays. A barium-meal examination revealed no abnormalities of deglutition, normal esophagus, no evidence of hiatal hernia, and no free regurgitation of barium into the esophagus in the head-down position; the stomach appeared normal, barium appeared in the proximal part of the jejunum within 15 minutes, and there was normal distribution in the small intestine.

Course in Hospital.—On a diet of whole cow's milk and rice cereal, the infant continued to regurgitate, and two days after admission intravenous therapy was started. After another two days of giving nothing by mouth, oral feedings were reinstituted and, for the first time, a diagnosis of rumination was considered. Observation revealed that the expulsion of food involved a reverse sucking movement with the tongue and lips shortly after eating, associated with a look of determination; this brought the food back to his mouth, and it then oozed out.

During the next few weeks, various regimens were attempted, including thickened feedings, phenobarbital by mouth and parenterally, chlorpromazine, dextro amphetamine sulfate, nasogastric feeding tube, and intravenous therapy in various combinations. All were without long-lasting success, so that by Dec. 28, 1958, the infant weighed 5,100 Gm. (11¼ lb.) (15% less than his weight on admission and almost 30% less than his weight two months prior to admission). During this period, values of serum electrolytes, blood urea nitrogen, and serum proteins remained within normal limits.

A month after the infant's admission, psychiatric evaluation was requested. The tentative diagnosis offered was infantile anxiety neurosis with depression and a psychophysiological reaction of rumination.

The Mother.—The mother was first interviewed in the presence of the pediatric house staff. She was obviously depressed. An attractive, moderately obese 21-year-old woman, she was disturbed about her baby's illness. The eldest of three girls, she had felt the least loved and had had a deprived childhood. Her parents had been dancers, and she had lived with an aunt until 3 years of age. At that time, the present patient's grandmother had an episode of acute melancholia, did not eat, had to be tube fed, and nearly died; she recovered but subsequently never was able to give adequate care to her children.

During adolescence and after her second pregnancy, the patient's mother became obese, probably secondary to depressive trends. After graduating from high school, the patient went to work. She dated considerably and at one time wanted to escape from home into military service. Instead, she married at age 18. She soon became disappointed in her husband's lack of education and inability to earn more from his factory work. The husband was a passive, compliant man, interested in his family, who reacted to his wife's nagging by staying away from home and occasionally drinking to excess.

In three years of marriage, she had three children. The eldest has rare asthmatic attacks, and fell, without significant injury, from a second-story window in August, 1958. Both he and the patient were described by the mother as being sensitive.

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The third pregnancy was unwanted. She resented being burdened with three children at 21 years of age. Hoping that a persistent vaginal infection would lead to abortion, she had not attended a prenatal clinic. The baby was born uneventfully at home. She felt that people were talking about her having three children in such close order. Unhappy, and prone to cry easily, she managed to care for her children until about three months prior to the patient's hospitalization, when her depression and inactivity increased. She developed severe headaches, was unable to do her housework, and stayed in bed. She began to prop up the infant in bed and spent little time with him. Then the rumination began.

Psychotherapy.—The patient's psychiatric needs were discussed with the pediatric house staff, and some changes in emphasis in treatment were advised. The rumination was understood to be a perverse pattern, developing a relation to the infant's anxiety, sense of neglect, depression, and insecurity at being rejected. More attention and fondling were planned, particularly during feedings. The infant responded at first but soon regressed to persistent rumination, and he was again tube fed. A female volunteer was enlisted to spend a few hours daily with him, but this, too, proved insufficient. Various nurses were able to abort his rumination temporarily by several methods. One nurse would scold him and, although this occasionally stopped his ruminating, he more often would cry and then regurgitate. Another nurse would fondle him and coo to him, but as soon as she had to leave he would ruminate again. The patient seemed voracious in his emotional needs, and it seemed impossible for the regular ward staff to satisfy these needs.

On Dec. 30, a full-time special nurse was engaged to spend eight hours daily with the patient. It was felt that this baby might respond to constant holding, warmth, and attention from one person. Fortunately, the nurse obtained was capable of performing this task with awareness of its importance. She stayed with him for one month, during which time a remarkable change occurred. He gradually ceased to ruminate and went from 5,100 to 6,700 Gm. (11¼ to 14¾ lb.). At the same time, he became a more responsive, happy baby, vocalizing and laughing, and he paid more attention to people and his surroundings. Significantly, at the beginning of special nursing, when the nurse was off duty, there was increased rumination.

Concurrently, one of us (M. L. S.) spent several hours a week with the mother. When it was suggested that the infant's difficulty might have a psychiatric genesis, she felt personally accused and guilty. Indeed, when she visited her baby, he seemed more disturbed, would scream and cry, and ruminated when she fed him. The mother was obviously tense and distant with the baby. She reduced her visits, and, when her child did not improve, she seemed pleased because this showed that she was not at fault. She was not discouraged from staying away from the child, since it was felt she might be better able to stabilize her own feelings in this way.

In psychiatric interviews, she was allowed to ventilate her feelings, and an attempt was made to allay her guilt. Gradually she was able to discuss better handling of her son. A doll was used to aid in demonstrating better ways of holding the infant close to her and not just leaving him propped or on her lap. Despite her sense of anxiety and depression, she was assured that the child needed her. As she began to visit her son again, she would hold him on her lap dutifully but without any mutual response. Gradually she held him more closely. As her son began to smile when she visited, she responded, and, reciprocally, his improvement helped her. She learned also by observing the behavior and handling of the baby by the special nurse and gradually was able to function better as a mother.

Follow-up.—The infant was discharged on Feb. 3, 1959. Since it was felt that the mother was unable as yet to undertake full responsibility, a part-time homemaker was arranged for from a community agency. The mother continued in psychotherapy. The infant progressed well, regurgitated rarely, and gained weight progressively; he weighed 10,000 Gm. (22 lb.) two months after discharge (a gain of over 3,000 Gm. [7 lb.] in two months). He reacted normally to people around him and seemed happier. He played and laughed with his siblings and matured to a level commensurate with his chronological age.

Comment

Some illnesses in infancy are complicated by emotional factors in the family. Comprehensive care requires attention to these factors. In most cases, this level of psychiatric treatment rests with the pediatrician, with psychiatric consultation when necessary. Additional personnel may be necessary to assist in this avenue of treatment. We are attempting to develop a "mother bank" of volunteers who would be able, under supervision, to act as mother-surrogates when needed.

This case also demonstrates the need for maternal love, fondling, and attention for the well-being and normal development of an infant. Furthermore, evidence is accumulating that emotional trauma in infancy may be of critical significance in the development of later psychiatric disorders. Early treatment seems to be the keystone to the prevention of later serious disorders. The rumination

seemed to be a physiological concomitant of anxiety and depression, coincident with a similar emotional disturbance in the mother. Separation of mother and infant by hospitalization was insufficient, because a pattern had already been established. The process was reversed by introducing a warm mother-surrogate. The mother received supportive psychiatric treatment, and, on the baby's discharge, a temporary homemaker was employed to help the mother make the transition to complete care by herself. The infant continued to improve and develop normally after discharge.

Summary

Psychotherapeutic management of both infant and mother brought improvement in a case of infantile rumination.

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V. 1

RETROCAVAL URETER—UNUSUAL CAUSE OF URETERAL OBSTRUCTION

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The term retrocaval ureter is used interchangeably with circumcaval or postcaval ureter, which describes the anatomic relationship of the ureter to the embryologically abnormal inferior vena cava. The designation preureteric vena cava more accurately describes the embryologic malformation; however, this is not as practical a term because the functional abnormality is only manifest clinically by obstruction of the ureter.

A retrocaval ureter courses toward the midline on the posterior aspect of the inferior vena cava before emerging medial and anterior to this structure and then descending into the pelvis. It is nearly always single and located on the right side. Hydronephrosis and hydroureter above the postcaval ureteral segment may develop if the vena cava produces sufficient obstruction. When obstructed, flank pain can occur with or without hematuria. Infection may also be present with the ureteral obstruction.

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In 1893, Hochstetter [1] first described retrocaval ureter in man. He and others found the abnormality also present in sheep, rabbits, cats, and hedgehogs. An excellent study by McClure and Butler [2] first described the essential features of the embryologically abnormal inferior vena cava which produces the aberration.

In figure 1 the postcardinal, subcardinal, and supracardinal veins are seen to be the essential vascular elements which form a ureteral venous ring during the development of the infrarenal vena cava. Normally the infrarenal vena cava arises from the dorsal portion of this ring which is composed of the postcardinal, supracardinal, and subcardinal veins. If, however, the ventral segment of the ring persists then a retrocaval ureter will exist. The ventral segment may persist with the posterior segment to produce a ring or alone as a preureteric vena cava. The preureteric vena cava is derived from the postcardinal and subcardinal veins.

The literature contains reports of 59 patients with retrocaval ureter and of these only 22 were treated surgically. Abeshouse [3] reported only one case in 120,000 general hospital admissions. On the

other hand, Pick and Anson [4] found one case in 570 anatomic dissections. The cadaver's ureter revealed no significant obstruction which would indicate the cause for the discrepancy in incidence.

Report of a Case

Our patient was a robust 37-year-old male who complained of increasing right flank distress for six months. The pain was not incapacitating but was

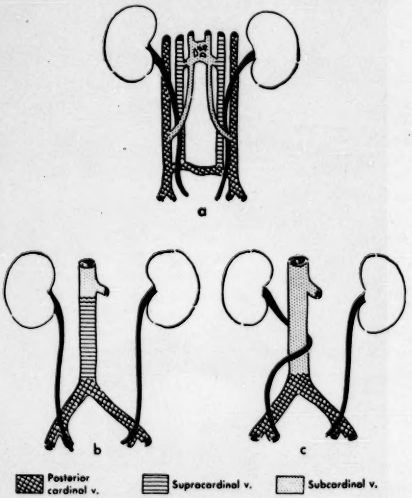

Fig. 1.—Embryology of infrarenal vena cava: *a*, bilateral ureteral venous rings normally present early in development of vena cava; *b*, normal adult vena cava; *c*, preureteric vena cava. (Reproduced, with permission, from Hollinshead, W. H.: Anatomy for Surgeons: II. Thorax, Abdomen, and Pelvis, New York, Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 1956, pp. 571-572.)

associated with frequency, urgency, and nocturia one to four times. He denied other symptoms or history referable to the urinary tract. The physical examination together with the hematological and serologic specimens were within normal limits. The urine contained 1 to 2 white blood cells, 7 to 10 red blood cells, and an occasional bacillus per high-power field. In addition to a normal plasma urea nitrogen level, the 15-minute phenolsulfonphthalein test result was 20% and the creatinine clearance was 86 ml. per minute. The endoscopic and cystocopic examinations of the urethra and bladder revealed no abnormalities.

The intravenous urogram disclosed a normal left pyelogram and an abnormal right ureter and renal pelvis. More exactly, the bulb retrograde pyelogram in figure 2 describes the right ureter which has an s-shaped curve at the junction of the middle and upper portion, with dilatation of the upper portion and renal pelvis. Characteristically, the postcaval portion passes medially toward, or occasionally even across, the midline, forming a sigmoid curve with the convexity upward and medial.[4] In figure 3 the oblique pyelogram shows the postcaval segment of the ureter to extend medially with the distal curve coursing posterior to the more proximal ureter. While a normal ureter will fall away, anteriorly, from the vertebral column, the postcaval ureter lies against the bodies of the lower lumbar vertebra. Presman and Firfer [5] emphasized this finding in the roentgenographic diagnosis by recording simultaneously placed radiopaque catheters in the inferior vena cava and the retrocaval ureter.

Therapy

Therapy for the relief of the ureteral obstructing preureteric vena cava is surgical repositioning of the ureter anterior to the inferior vena cava. Four basic methods have been utilized in the repair of

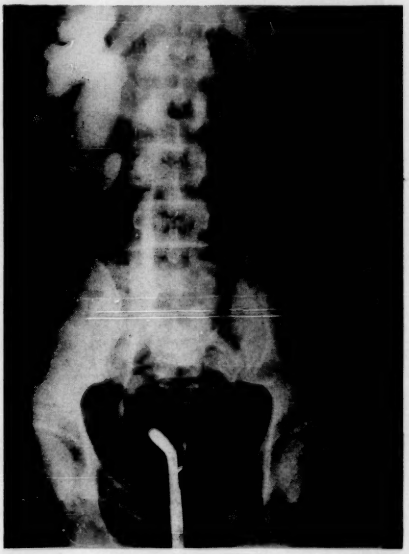

Fig. 2.—Preoperative right bulb retrograde pyelogram.

retrocaval ureters. These are (1) section and reanastomosis above the postcaval segment, (2) section near the postcaval segment with or without removal of a ureteral segment prior to reanastomosis, (3) section at the ureteral-vesical junction with reimplantation of the ureter into the bladder, and

(4) section of the inferior vena cava without incision into the ureter. Although Abeshouse,[3] who reviewed the surgical treatment of 22 patients, believed that each patient must be treated individually, section above the postcaval segment generally gave the best results. Only one patient with inferior vena cava section was reported and the result of surgery was good. Further work may prove the latter procedure valuable; however, the inherent possible complications of such a procedure did not, in our opinion, justify its use in our patient.

Our patient's right ureter was freed bluntly from the infrarenal vena cava, sectioned in the upper dilated portion, and drawn anterior to the vena cava. Here, it was examined closely to be certain that the postcaval segment was normal before the lower segment was spatulated and the equal ureteral openings approximated without a splinting catheter. The postoperative period was uneventful and the flank drainage stopped on the 13th day after operation.

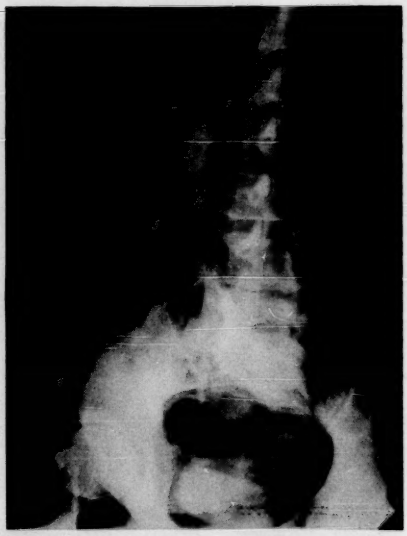

Fig. 3.—Preoperative right oblique bulb retrograde pyelogram.

The intravenous pyelogram taken six weeks after operation (fig. 4) showed prompt function with no alteration in the upper portion of the ureter or pelvic dilatation. Initially after operation his urine contained numerous white blood cells and bacilli; however, on discharge from the hospital he was free of pain. After three months the urine showed no bacteria and only an occasional white blood cell. He is now asymptomatic and has resumed his job as a manual laborer.

Summary

A retrocaval ureter is an unusual cause of hydronephrosis which is produced by the embryologic malformation of the infrarenal vena cava. If recognized before the resultant hydronephrosis has destroyed the kidney, operative correction of the defect can prevent further damage to the kidney. Sectioning the dilated upper ureteral segment in order to gain proper ureteral positioning and wide-caliber reanastomosis without intubation proved to be a successful method for surgical correction of the retrocaval ureter.

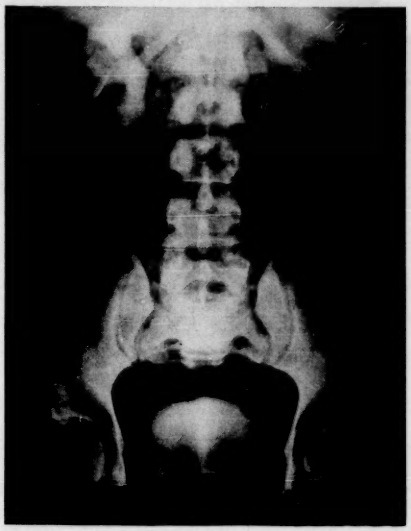

Fig. 4.—Intravenous urogram taken six weeks after operation.

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V. 1

DEFICIENCY OF PROTHROMBIN AND PROCONVERTIN AFTER THERAPY WITH PROPYLTHIOURACIL

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and
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Thiouracil and its derivatives have been implicated as the cause of a variety of toxic reactions, the most common of which are agranulocytosis, leukopenia, and drug fever; cases of hepatitis and thrombocytopenia have also been described.[1] Recently we have observed two patients in whom severe bleeding occurred after administration of propylthiouracil. Survey of the literature revealed only three cases in which disturbance of the clotting mechanism was reported after the use of propylthiouracil.[2] In these patients the defect was associated with a prolonged Quick prothrombin time and appeared to respond to administration of blood or serum. Observations on our two patients have suggested a similarity between this apparently rare reaction to propylthiouracil and the therapeutic response to bishydroxycoumarin (Dicumarol). Since this appears to be a serious but little-known complication of the use of the latter drug, it is hoped that presentation of results of studies done on our cases will be of value.

Report of a Case

A 60-year-old housewife was admitted to the University of Minnesota Hospitals on Aug. 2, 1957. She was referred because of the development of purpura, hematuria, and bleeding gums of three days' duration. These symptoms had appeared four weeks after the initiation of a course of propylthiouracil, 400 mg. daily, for a toxic nodular goiter. Goiter had been present since she was 16 years of age. The only other medicaments she had received in the recent past were penicillin orally administered for a viral pneumonitis and an unknown vitamin preparation.

She was first admitted to another hospital at the onset of symptoms. At that time, the patient's hemoglobin level was 9.9 Gm.%, the leukocyte count was 9,800 per cubic millimeter, platelets "appeared normal on smear," and the urine was grossly bloody. She was given 200 mg. of cortisone acetate intramuscularly and 1,000 ml. of whole blood. She was then transferred to the University Hospitals and admitted on the evening of Aug. 2, 1957, the third day of her illness.

There was no history of serious bleeding requiring treatment in the patient or in members of her family, although she felt that she, her mother, and a brother had always bruised easily. When she was 34 years old the patient had an abdominal cystic mass removed without hemorrhagic complications. The remainder of her history was not significant.

Physical examination revealed a blood pressure of 130/70 mm. Hg, a pulse rate of 88 per minute, and a normal temperature. The patient was thin and anxious, with a body weight of 87 lb. (39.5 kg.) and fine hair. There was no lid lag. A firm, enlarged nodular thyroid, over which no bruit could be heard, was noted. There was no lymphadenopathy and no hepatosplenomegaly. Neurological examination revealed quick, deep tendon reflexes without pathological reflexes. There was no tremor. The most striking physical finding consisted of ecchymotic areas over the arms, chest, and legs. Purpuric areas were noted on the buccal mucosa and the palate. Result of the Rumpel-Leede test was negative. The remainder of the physical examination was normal.

Laboratory data revealed a hemoglobin level of 13.8 Gm.%, a leukocyte count of 10,950 per cubic millimeter, and platelet counts of 156,000 and 200,000 per cubic millimeter on Aug. 2 and Aug. 3, 1957, respectively. The urine was amber in color and contained 1+ albumin and 3+ erythrocytes. The erythrocyte sedimentation rate (Westergren) was 63 mm. per hour. Liver function tests showed a sulfobromophthalein retention of 0%, an alkaline phosphatase level of 7.2 King-Armstrong units, a thymol turbidity of 1 unit, a cephalin-cholesterol flocculation value of 2+, and a cholesterol level of 122 mg.%. An x-ray of the chest was normal, and an electrocardiogram revealed a sinus tachycardia with a vertical heart. Subsequently, an x-ray film of the neck revealed several small irregular, calcified areas just above the thoracic inlet in the lower part of the neck, which were felt to represent calcifications within thyroid adenomas. The trachea was shown to deviate slightly to the right. Rate of radioactive iodine uptake was 16%, level of protein-bound iodine 8.3 mcg.%, and level of blood urea nitrogen 47 mg.%. Stool guaiac reaction was 2+. Bleeding time (Ivy) was 4 minutes, blood clotting time (capillary) 6 minutes 30 seconds, prothrombin time (Quick) 33.6 seconds (control 14.0), and clot retraction normal.

The patient was given 25 mg. of phytonadione (vitamin K_1 oxide, Mephyton) intravenously, and four hours later a similar dose was given. The following day, the prothrombin time was 19.8 seconds

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(control 14.8). Between Aug. 2 and Sept. 1, 1957, although no further bleeding occurred, repeated doses of phytonadione were necessary to control the level of the prothrombin. The blood urea nitrogen

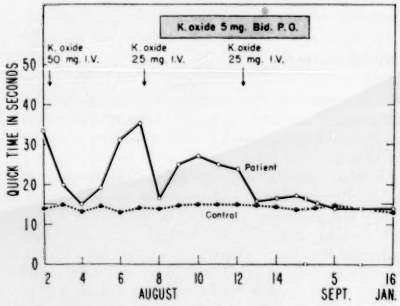

Fig. 1.—Response to phytonadione as measured by Quick prothrombin time.

level was 21 mg.% on Aug. 8. Requirements of phytonadione and fluctuations in the prothrombin time are shown in figure 1.

The patient was discharged on Aug. 15, 1957, on a regimen of a daily, oral dose of phytonadione, which was discontinued on Sept. 1, 1957. Three weeks after discharge, the Quick prothrombin time was 13.9 seconds. She was seen again after four months, at which time the prothrombin time was 13.7 seconds. She had gained 20 lb. (9.1 kg.) in body weight since discharge from the hospital and was completely asymptomatic, with a hemoglobin level of 15.6 Gm.%, and a protein-bound iodine level of 6.4 mcg.%. She was clinically euthyroid.

Quick Method Prothrombin Times, per Milliliter—Mixtures of Patient's Plasma and Known Plasmas

Patient's Plasma	Saline	Normal Plasma	Normal Adsorbed Plasma	Normal Serum	Proconvertin-Deficient Plasma	Stuart Factor-Deficient Plasma	Prothrombin Time, Sec.	Correction
0.1							18.4	
0.05	0.05						23.5	
		0.1					13.8	
	0.05	0.05					15.6	
0.05		0.05					14.5	+
0.08		0.02					14.5	+
0.05			0.05				24.0	0
0.05				0.05			12.0	+
0.05					0.05		25.4	0
0.05						0.05	13.2	+

Experiments with Prothrombin and Proconvertin Activity

In order to define the deficiency made apparent by the prolonged Quick prothrombin time, two experiments were conducted during our patient's period of hospitalization. These studies were confined to the aspect of coagulation measured by the Quick prothrombin system.

Experiment 1.—Mixtures of the patient's plasma with normal plasma, normal barium sulfate–adsorbed plasma, normal serum, and plasmas deficient in proconvertin (factor VII), and in Stuart factor were measured by the Quick system. Results obtained from these mixtures are shown in the table. Correction of the patient's prolonged Quick prothrombin time occurred with normal plasma, normal serum, and plasma deficient in Stuart factor. No correction occurred with barium sulfate–adsorbed plasma, nor with plasma deficient in proconvertin. These results indicate that the defect was (1) probably not due to the presence of a circulating anticoagulant; (2) not due to a lack of fibrinogen (factor I), proaccelerin (factor V), or the Stuart factor; and (3) corrected when plasma or serum containing prothrombin and/or proconvertin was added to patient's plasma.

Experiment 2.—The combined activity of prothrombin and proconvertin was measured by the

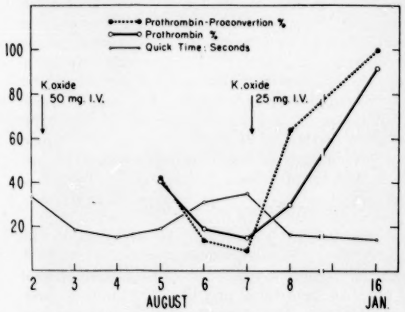

Fig. 2.—Response to phytonadione: comparison of Quick prothrombin method and prothrombin-proconvertin method. Units on ordinate represent seconds (Quick time) and per cent activity (prothrombin-proconvertin method).

method of Owren and Aas.[3] Prothrombin was measured by the specific one-stage method of Hjort and co-workers,[4] with use of Russell's viper venom and cephalin as thromboplastin. Results are shown in figure 2. When the prothrombin method of Hjort was altered to eliminate the effect of the Stuart factor,[5] identical results were obtained. The prothrombin–proconvertin concentration, which decreased to less than 10% even after institution of phytonadione therapy, did not respond until the sixth day after a total of 75 mg. of phytonadione had been administered. The concentration of prothrombin, which decreased to 15%, appeared to return toward normal more slowly. After four months, normal levels were found in both test systems.

Venous clotting times (modification of Lee-White method), determined on Aug. 6, 1957, and on Jan.

16, 1958, were within the normal range of 14 to 20 minutes (15 minutes 30 seconds and 20 minutes respectively).

It was concluded that the patient had a dual deficiency of prothrombin and proconvertin.

A brother of the patient, referred to by her as showing easy bruisability, was found to have a normal Quick prothrombin time, normal prothrombin concentration, and normal prothrombin–proconvertin concentration.

Comment

Three cases of "hypoprothrombinemia" after propylthiouracil treatment have been described in the literature. Craddock and associates,[2a] in 1951, reported a 16-year-old girl who had received 300 mg. of propylthiouracil daily for a period of six months, at which time hospitalization was required for continuous bleeding from the nose and from an abrasion on her arm. Routine laboratory tests were all normal, including liver function tests, with the exception of the Quick prothrombin time which was 200 seconds (control 12). Bleeding was controlled with repeated injections of thrombin-free serum, and the prothrombin time returned to normal levels within five days. Craddock concluded that this patient had a deficiency of labile factor (proaccelerin), which he attributed to a toxic effect of the propylthiouracil.

A second case was reported by Miner in 1955.[2b] He described a 43-year-old woman who noted hematuria, hemoptysis, and excessive uterine bleeding after five months of propylthiouracil therapy. All studies were normal except for a blood coagulation time of 32 minutes and a Quick prothrombin time of 20 seconds (control 13). She was treated with a 5-ml. intravenous dose of phytonadione, cortisone, and infusion of one unit of blood. Dramatic improvement was noted. The prothrombin time returned to normal within 48 hours. After three months no evidence of recurrent bleeding appeared. Miner postulated that the whole-blood transfusion provided the plasma factor or the "labile factor" and concluded that this was the factor deficient in this patient's blood.

A third case was reported by Goldstein [2c] in 1951 and, although he did not implicate propylthiouracil as the precipitating agent, in the light of the cases subsequently reported this seems the most likely cause. He described a 27-year-old man who had been treated with propylthiouracil for a period of only 10 days when hematuria, hematemesis, and purpura occurred. Findings of all studies were normal except for a blood coagulation time of 42 minutes and a Quick prothrombin concentration of less than 10%. This was corrected and the bleeding controlled with infusion of whole blood and administration of 370 mg. of menadione (vitamin K, Hykinone) sodium bisulfite over a 72-hour period. Goldstein did not attribute these findings to propylthiouracil, but stated that no other apparent cause could be found.

An additional case has recently come to our attention [6] of a 13-year-old girl who developed melena, nosebleeds, hematuria, and purpura after nine weeks of propylthiouracil therapy. Prothrombin time was reported to be 41 minutes. Phytonadione was administered intravenously. We had the opportunity to examine a sample of the plasma from this patient which had been obtained two days after initiation of phytonadione therapy. The combined prothrombin–proconvertin concentration was less than 10% and that of prothrombin alone was about 8%. Eight days later, another sample of this patient's plasma was examined in our laboratory. The Quick prothrombin time was now 16.2 seconds, and addition of normal serum shortened this to 12.7 seconds. Normal, adsorbed plasma had no effect. Combined prothrombin–proconvertin concentration was 75%, and prothrombin concentration was normal. Five days later, and on the subsequent, consecutive four days, the Quick prothrombin time was normal.

Studies done on the patient we are reporting revealed that, of the known factors measured with the prothrombin method of Quick (i. e., prothrombin, proaccelerin, proconvertin, Stuart factor, and fibrinogen), the deficiency was probably limited to prothrombin and proconvertin. In mixing experiments, only plasma or serum containing one or both of these corrected the prolonged prothrombin time of the patient's plasma, and no correction was observed when proconvertin was lacking. This finding lends significant support to a hypothesis of deficiency of proconvertin. That prothrombin also was lacking was shown by the method specific for prothrombin. Experiments such as these were not reported in the cases of Craddock [2a] and Miner,[2b] and, although their conclusions with regard to these deficiencies differ from ours, it seems probable in view of current concepts that these deficiencies were similar to that seen in our patient.

The characteristic response of the coagulation system to administration of bishydroxycoumarin (Dicumarol) is a specific reduction in concentration of prothrombin and proconvertin [7] (plasma thromboplastin component and the thromboplastin-forming stage of coagulation will not be considered here). Similarly, a combination of hypoprothrombinemia and hypoproconvertinemia may occur in severe liver disease.[7] No history of ingestion of bishydroxycoumarin could be elicited from our patient. Liver function tests did not indicate severe liver disease. Evidence of a severe coagulation deficiency together with little or no effect on other systems makes it apparent that the toxic effect of propylthiouracil was directed primarily against the clotting mechanism. The failure of a single administration of phytonadione to induce a permanent

correction of the prothrombin time is of interest and may indicate the severity of the deficiency produced.

It is suggested that propylthiouracil may, although infrequently, result in a specific impairment of the coagulation system with a deficiency of prothrombin and proconvertin and that this defect can be corrected by vigorous treatment with parenteral administration of phytonadione.

Summary

A hemorrhagic tendency is a rare but serious manifestation of propylthiouracil toxicity. Our studies suggest that this bleeding tendency arises from a specific dual deficiency of prothrombin and proconvertin. Administration of phytonadione (vitamin K_1 oxide, Mephyton) corrected this deficiency, but repeated administration of this drug was necessary to maintain a normal Quick prothrombin time.

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The blood plasma deficient in proconvertin was supplied by Prof. P. A. Owren, Department of Medicine, Rikshospitalet, Oslo. The blood plasma deficient in Stuart factor was supplied by a patient reported by Gonyea and Krivit.[5]

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V. 1

ACUTE BLOOD LOSS REQUIRING NINETY-FIVE TRANSFUSIONS

REPORT OF A CASE

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and
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A case of a patient with an endometrial sarcoma that was treated by radical pelvic surgery is of interest because of the manner in which acute loss of blood was managed.

A 43-year-old woman, gravida 3, para 3, was admitted to the New England Center Hospital because of pain and swelling in her lower extremities. For the past three years she had noted irregular, and occasionally profuse, vaginal bleeding. Three weeks prior to admission her right leg became swollen and, more recently, her left. She denied any gastrointestinal or genitourinary symptoms.

Her history revealed that a dilation and curettage had been performed seven years prior to this admission. The pathological diagnosis at that time had been benign secretory endometrium and chronic cervicitis.

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Physical examination revealed a blood pressure of 130/80 mm. Hg and a pulse rate of 84 per minute. The chest was clear to percussion and auscultation. The heart sounds were normal, and there were no murmurs. Positive findings were limited to the abdomen, pelvis, and extremities. A firm, tender mass was palpable to the umbilicus. The mass descended into the pelvis where it was fixed, displaced the cervix to the left, and extended to, but did not involve, the pelvic walls. There was no swelling of the extremities.

Laboratory examinations revealed a hemoglobin level of 8.5 Gm. per 100 cc. and a hematocrit of 29.5%. The blood sedimentation rate was 76 mm. per hour (Westergren method). The platelet count was 475,580 per cubic millimeter, and the prothrombin time 100%. The bleeding time was normal. The level of blood urea nitrogen was 12 mg.% and

that of creatinine 0.5 mg.%. The remainder of the laboratory results, including those of liver function tests and determination of serum electrolytes, were normal.

An intravenous pyelogram revealed what appeared to be an obstruction of the right ureter. There was normal function in the left kidney. The remainder of the roentgenographic studies showed pressure defects secondary to the tumor but no involvement of the gastrointestinal or urinary systems. Findings of an electrocardiogram were normal.

The patient was given a preoperative transfusion of 2,000 cc. of whole blood and the hematocrit, determined immediately preceding operation, was 39.5%. At operation, one week after admission, after a dilation and curettage, a large tumor mass was found, which arose from the fundus of the uterus and invaded the base of the bladder and extended to the pelvic walls. The pelvic veins were filled with "fleshy" material initially thought to consist of thrombi. The hypogastric arteries were ligated and divided, and an anterior exenteration was performed. On the left side a cutaneous ureterostomy was done and the right ureter was ligated. There was persistent bleeding, most of which occurred along the pelvic walls near the greater sciatic notches. Individual vessels were ligated and then oversewn en bloc. Hot packs, pressure packs, and bone wax were applied to the bleeding areas without effect. The hematology service was consulted, and blood was drawn for an evaluation of the clotting mechanism. There was no evidence of a clotting defect or fibrinolysis. The blood loss had reached a critical level in spite of aortic compression and the occlusion of the common iliac vessels with bulldog clamps. Fresh blood, in plastic containers, was given intravenously under pressure into both arms and one leg. The pelvis was finally packed with 27 ft. of 3-in. gauze, one end of which was brought out through the vagina. The wound was closed with through-and-through steel wires in addition to a running suture in the peritoneum and a fine silk suture in the skin. The operative procedure lasted 11 hours. In spite of the normal findings of blood analysis, 9 Gm. of fibrinogen, 40 mg. of conjugated estrogenic substances (Premarin), 200 mg. of cortisone acetate, 7 Gm. of calcium gluconate, and 250 mg. of phytonadione (Mephyton) were given intravenously during the procedure; 92 pints of whole blood was given in the operating room.

At the conclusion of the operation, clear urine was coming from the cutaneous ureterostomy. The patient's blood pressure was 80/60 mm. Hg, and the pulse was weak, with a rate of 72 per minute. The weighed blood loss was 45,000 cc. and its replacement 45,740 cc. When the patient was transferred to the recovery area, blood was oozing from the incision. At 9:30 p.m., two hours after the operation, the blood pressure was 80/45 mm. Hg, and the pulse rate 100 per minute. At 11 p.m., the pulse rate was 80, and the skin was cold; an infusion of 500 cc. of whole blood was started. At midnight the 94th pint of blood was given, and at 4 a.m., the 95th. The blood pressure remained at 80/60 mm. Hg, and the pulse rate was 110 per minute. By 8 a.m. the following morning the bleeding had stopped and the record of vital signs was as follows: blood pressure 124/80 mm. Hg, pulse rate 84 per minute, and respirations 20 per minute; the axillary temperature was 97.8 F (36.6 C). The skin was warm, and the pulse was strong. The patient was alert and cooperative. There was about 15 cc. of urine in the disposable bag attached to the ureterostomy.

Metabolic and hematological consultations were obtained. Examination of the urinary sediment was not suggestive of tubular necrosis, but because of this possibility only small amounts of hypertonic dextrose were given. Levels of serum electrolytes, 12 hours after operation, were as follows: sodium 144 mEq. per liter, potassium 4 mEq. per liter, chloride 83 mEq. per liter, and carbon dioxide 41 mEq. per liter. The hematocrit was 35.5%, and blood urea nitrogen level was 20 mg.%. The rise in carbon dioxide level was thought to be due to the 7,125 cc. of citrate given during the operation. Hematological studies did not reveal clotting defects or abnormal blood indexes. During the first 24 hours after operation, 375 cc. of urine was passed.

By the third postoperative day bowel sounds were present. The electrolyte values improved, and the blood urea nitrogen level reached a high of 26 mg.% on the second postoperative day. The creatinine level, which had been reported as 0.5 mg.% preoperatively, rose to 1.0 mg.% on the second postoperative day and fell to 0.8 mg.% on the fourth postoperative day. The hematocrit fell to a low of 30% on the sixth postoperative day. On the fourth postoperative day 6 ft. of the vaginal pack was removed. The patient complained of pain in the sciatic area as the pack was pulled, and drop foot was noted at this time. No cardiorespiratory complications developed. The lungs remained clear. The electrocardiogram suggested electrolyte disturbance. All of the original pack was removed by the seventh postoperative day. On this day one additional unit of whole blood was given. Normal intestinal activity was present on the eighth postoperative day, and by the ninth day the wound was well healed, and the patient was taking nourishment by mouth. The drop foot improved.

On the 13th day, after removal of the wire staysutures, fluid was coming from the vagina. Methylene blue studies revealed leakage of urine from the previously ligated right ureter. An intravenous

pyelogram showed marked hydronephrosis on the right, with minimal dilatation of the drainage system on the left side. It was felt that removal of the pack had weakened the ligatures. The ureter was religated by means of a retroperitoneal exposure. The patient tolerated this additional procedure well.

One week later she developed diarrhea. A pelvic abscess was drained per vaginam. One month after operation the pelvic cavity was examined through the vagina with a proctoscope, and a biopsy specimen was taken of the granulating base. The pathological report revealed no evidence of malignancy. One week after the latter procedure the patient developed a temperature of 101 F (38.33 C), and a friction rub was heard in the left posterior lung field. An x-ray of the chest revealed a small amount of fluid at both bases. No chemotherapy was given. The fluid disappeared within four days, and the patient became afebrile. She was discharged afebrile and essentially well, except for residual drop foot on her 41st postoperative day.

The laboratory studies at the time of discharge revealed the following findings. X-ray of the chest and electrocardiogram were normal. The blood urea nitrogen level was 11 mg.% and those of serum electrolytes normal. The hematocrit was 38.5%. Urine culture grew Proteus vulgaris, with a colony count of over 10 million organisms per milliliter. Arrangements were made to have the Visiting Nurse Association supervise the care of the ureterostomy and the irrigation of the perineum.

The patient's progress was followed and, at the last office visit, in April, 1959, she had gained 25 lb. (11.4 kg.). The ureterostomy was functioning well, and the drop foot showed continued improvement. A follow-up intravenous pyelogram revealed no function on the right and slight dilatation of the pelvis and ureter on the left side. There had been no significant change since the postoperative pyelogram. A repeat urine culture revealed Proteus vulgaris, 47,000 organisms per milliliter. The hematocrit and the blood urea nitrogen level remained normal.

The final pathological report was as follows: endometrial stromal cell sarcoma, with conspicuous endolymphatic and intravenous extension. Examination of the gross specimen revealed a tumor filling the pelvic veins.

Gardner and associates [1] reported 58 transfusions in connection with a case of placenta percreta in which the control of bleeding was finally accomplished with the application of pneumatic pressure to the lower half of the body. Artz and associates [2] reported on a battle casualty of the Korean war to whom 23,350 cc. of whole blood was given within 24 hours.

The case reported here demonstrates that massive blood transfusion is compatible with life and that renal function, even with one kidney, may survive such an insult. The patient's blood was type A, Rh-positive, and she received only this type during and after operation. The occurrence of drop foot was probably the result of pressure on the sciatic nerve. To our knowledge the amount of blood administered to this patient within a 24-hour period is the largest recorded to the time of writing.

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V. 1

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MANAGEMENT OF THE DEPRESSED PATIENT.—Physicians in all medical specialties are called upon at times to diagnose and to treat patients who are depressed, and who threaten or attempt suicide. Without doubt, many of the acknowledged 16,200 suicides each year in this country are the result of a diagnostic or therapeutic failure with patients suffering from serious depressive illness. (The reported total of 16,200 is very likely only a fraction of the total number: the social stigma of suicide, along with insurance considerations, may result in a great deal of covering up by the patient, his family and others.) The family physician is frequently the person to whom the depressed patient turns prior to making serious self-destructive attempts. . . . In no case should the patient leave the physician's office without being given a definite return appointment. Because of the sleeplessness and agitation usual in this condition, there is a timeless quality present, and the patient should not be left for a long period to his own devices. The physician should not prescribe large doses of medicine of any sort, especially sedatives. Large amounts of barbiturates or tranquilizers make potent weapons. Also, having the patient return at least once every week for refills of medicine represents a fine way to guarantee sustained medical observation.—M. H. Miller, M.D., C. H. Fellner, M.D., and N. S. Greenfield, Ph.D., Depression, Suicide and Suicidal Gesture in Medical Practice, *Annals of Internal Medicine*, July, 1959.

SPECIAL ARTICLE

DEVELOPMENT OF SURGERY IN THE SOUTH

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The South has probably contributed as much to the development of surgery as any other section of the nation. Before the introduction of antisepsis and asepsis and the availability of anesthetic agents, performance of surgical procedures was attended with considerable risk and tremendous suffering. Although the South cannot claim credit for the development of asepsis, ether anesthetization, use of which makes an operation painless, was first used in the South and marks one of the really great milestones in the progress of surgery. Although ether had been synthesized in 1540 and its effects were known to be similar to those of nitrous oxide, it was not until March 30, 1842, that ether was first used for surgical anesthesia when Crawford W. Long at Jefferson, Ga., in Jackson County, removed a tumor from the neck of James W. Venable. However, P. A. Wilhite, of Anderson, S. C., was the first to produce anesthesia with ether, albeit accidentally, in 1841. "The negro boy to whom Dr. Wilhite administered the ether became so profoundly insensible that the Doctor, thinking that he would not recover from the anesthetic, had his horse saddled and intended to escape into Tennessee."[1] Even though Long did not publish the results of his original work until December, 1849, he used ether successfully in eight operations before Morton's contribution in 1846.[2]

Contributions in Gynecology

Surgery was given a tremendous impetus when Ephraim McDowell performed the first successful ovariotomy, on Mrs. Jane Crawford, Dec. 13, 1809. Unfortunately, the report of this was not published until 1817. McDowell reported 13 operations on diseased ovaries with four deaths, eight recoveries, and one failure to complete the operation because of adhesions.[3]

A southerner, Dr. Jessie Bennett, performed the first cesarean section in the United States in Rockham County, Va., on Jan. 14, 1794.[4] The patient was his wife and he used Roussel's textbook as a guide. Both mother and baby recovered. J. L. Redmond of Newtown, Ohio, performed the second cesarean section in the United States in 1827, and the third was performed in Louisiana three years later by Prevost, who performed three others, with the loss of only one mother; he performed cesarean section on one woman twice.[5] In 1816, John King, of South Carolina, operated on a woman with extrauterine pregnancy by incising the vaginal wall and applying pressure on the abdomen above and forceps to the fetus; both mother and child survived.[6] In 1813, Joseph Glover of South Carolina successfully performed a hysterectomy.[1] Also on Aug. 12, 1801, he performed the first splenectomy, with recovery of the patient.[1]

Another gynecologic operation developed by a southerner, J. Marion Sims, a native South Carolinian, practicing in Montgomery, Ala., was correction of vesicovaginal fistula. In 1845 he first advocated the knee-elbow (Sims) position and fashioned a duck-bill speculum from a pewter spoon which enabled visualization of the fistulous opening.[2] After experimenting with many techniques of closure of vesicovaginal fistulas, he concluded that previous failures had been due to use of silk sutures that had become infected, so he used pure silver sutures with success. Although Sims is best known for his gynecologic contributions, he successfully operated on a patient with a hepatic abscess in 1835, successfully removed the mandible from a mouth in 1837, and removed the maxilla because of carcinoma of the antrum. In 1878, he probably did the first cholecystotomy for biliary calculi in the South. This was 10 years after the operation had been originally performed by J. S. Bobbs, of Pennsylvania, although Sims was unaware of Bobbs' operation.

In 1900 Cartledge, of Louisville, discussed mammoth ovarian tumors and described a cyst weighing 245 lb. He was a prolific writer and did considerable investigation on surgery of the gallbladder and intestinal tract.[7]

Pioneers in Urology

One of the early operations performed in the South was lithotomy. Benjamin W. Dudley, a native of Virginia, who had considerable training in Europe, returned to Lexington, where he became professor of anatomy and surgery at Transylvania University in 1819. He was one of the best-known lithotomists of his time. He performed more than 225 lithotomies and had a consecutive successful series of 100. In addition he treated, by trephina-

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tion, six patients with posttraumatic epilepsy, four of whom were cured.[7] His first patient was treated in 1819, which, according to Gross,[8] was the first in America. In 1852 Hardin, of Louisville, also reported relief of symptoms after trephination in patients with posttraumatic epilepsy.[8] Dudley was the first surgeon to treat fungus cerebri by sustained and gentle pressure with a dry sponge maintained in place by roller bandage.[3] He popularized use of roller bandages in the treatment of many surgical conditions, such as edema associated with infection and trauma.

Other contributions to urology were by Gilmore,[9] of Mobile, Ala., who, in 1871, reported a case of successful nephrectomy performed on a woman in December, 1870, and by J. Marion Sims,[2] who devised a special catheter for emptying the bladder which could be used during healing after repair of vesicovaginal fistula.

Southerners Perform First Amputations in the United States

In 1806 Walter Brashear,[3] of Lexington, was the first person in America to perform amputation at the hip. Although this operation had been unsuccessfully performed by Kerr in England in 1744, Brashear had no knowledge of it. He had considerable experience in the treatment of diseases of the bones and joints and in trephining for fractures of the skull. He subsequently moved to Louisiana and became a United States senator. In 1810 Deaderick,[10] of Tennessee, performed a hemimandibulectomy, presumably for cystic disease of the mandible.

Apparently amputations were rather common operations early in United States history. Eve,[11] writing in 1846, was distressed by the fact that Europeans considered that the mortality after performance of amputation in the United States was extremely high. He reported successful results in performing seven amputations of the leg and seven of the thigh. He emphasized the importance of compression bandages in order to prevent "both hemorrhage and inflammation."

In 1852 Gross,[12] professor of surgery at the University of Louisville, reported complete or partial resections of the mandible in seven patients and of the inferior maxilla in five patients. All of the former did well and four of the latter died. In 1850 Gross [13] resected most of the scapula, for an osteosarcoma. Robert A. Kinloch, professor of surgery at the South Carolina Medical College, was the first person in America to wire a fracture of the mandible successfully and to resect a knee joint.[14] In 1857 Parker [1] reported excision of the hip joint for tuberculosis. In 1811 McCreary, of Kentucky, resected the clavicle for osteosarcoma.[8] Nott [15] of Mobile, Ala., first described coccygodynia and successfully treated the condition by extirpation of the coccyx in May, 1844.

Tobias G. Richardson, professor of surgery at Tulane University, performed the first successful amputation of both legs at the hip joint in one stage.[5] Schupert, also of New Orleans, early removed the scapula for malignant disease.[8] In 1825 Robert B. Butt, of Virginia, resected the lower two-thirds of the ulna. Chopin, of New Orleans, removed the entire radius and, in 1853, Compton, also of New Orleans, removed the radius and all but the inferior extremity of the ulna.[8] Carnochan, of Savannah, resected the ulna in 1853,[16] the radius in 1854 [17] and the os calcis in 1857.[18] In 1913, Parham and Martin, of New Orleans,[19] described a metallic band for use in oblique fractures.

Important Contributions in Orthopedic Surgery

Of importance in the diagnosis of dislocation of the shoulder was an observation made by Dugas [20] in 1856. He considered the following criterion unequivocal evidence of dislocation of the shoulder: "If the fingers of the injured limb can be placed [by the patient or the surgeon] upon the sound shoulder while the elbow touches the thorax there can be no dislocation and if this cannot be done, there must be a dislocation."

Barney Brooks of Washington University, subsequently chairman of the department of surgery at Vanderbilt University, did considerable work on bone regeneration and bone growth. In 1924 he [21] performed the first arteriography in the United States. In addition to considerable work on Volkmann's ischemia and intestinal obstruction, he [22] was without doubt one of the best teachers of surgery. Venable and associates [23] of San Antonio, Texas, experimentally showed the effects of electrolysis of bone produced by certain metals and introduced Vitallium as a safe metal.

Early Success in Removal of Tumors

Eve,[24] of Georgia, reported local removal of a giant polypus from the base of the cranium in 1836. Its recurrence necessitated resection of the maxilla and palatine plate of the palate. George Cupples, of Texas, was the first in the United States to extirpate the tongue for cancer, according to Nunnally's method.[25] Cupples was also chairman of a committee on surgery of the Texas State Medical Association, which in 1872 reported a mortality of 8% among 4,293 operations performed in Texas.[26] Gilmore,[9] of Mobile, reported four cases of excision of the tongue for carcinoma.

In the early part of the last century, Charles A. Luzenberg, one of the founders of the University of Louisiana (which is a forerunner of Tulane University), its first dean and professor of surgery, removed a tumor of the parotid [27]; L. M. Tiffany, of Maryland, in 1878 successfully removed a large nasopharyngeal polyp,[28] and in 1886 he [29] removed a tumor of the liver. Parker,[1] of Charleston, S. C.,

was the first surgeon in the United States to suture a divided nerve successfully, and he reported this in 1881.

Surgery of the Chest and Abdomen

Although relatively rare, thoracic operations were performed before the introduction of anesthesia and asepsis. Early in the last century Warren Stone, of New Orleans, was one of the first persons deliberately to resect a rib for drainage in empyema.[5] Antony,[30] of Georgia, in 1821, operated on a boy for necrosis of the rib and empyema, which were complications of an injury sustained three years previously. The overlying ribs and most of the lung were excised. It was necessary to remove additional portions later. Not less than two-thirds of the right lung had been removed. The patient did well after the removal of all the ribs from the fifth to the diaphragm, but measles subsequently developed and the patient died on July 11, 1822.

As in surgery of the thoracic cavity, surgery of the abdomen was rarely attempted before the introduction of anesthesia and asepsis. Gross, in 1843, and Sims, just shortly before his death, suggested laparotomy in the treatment of penetrating gunshot and stab wounds, but neither was able to use it.[1] However, in July, 1867, Kinloch,[31] of Charleston, reported a case of a Confederate soldier in whom he successfully resected the injured intestine and reestablished intestinal continuity. In 1835 Luzenberg, of New Orleans, performed the first successful resection of a gangrenous intestine associated with strangulated hernia, with reestablishment of intestinal continuity.[5]

Halsted, as professor of surgery at Johns Hopkins University, probably exerted a greater influence on surgical training than anyone else in the world. He introduced the experimental method of teaching surgery as well as the present concept of residency training. His fundamental work on intestinal and vascular anastomoses, conduction anesthesia, and development of original operations for the cure of inguinal hernia, cancer of the breast, and thyroid disease make him almost an immortal surgeon. He also introduced use of rubber gloves in the operating room because his surgical nurse, who subsequently became Mrs. Halsted, was allergic to the frequently used bichloride of mercury. In 1898 he performed the first successful operation for carcinoma of the ampulla of Vater.[2] In 1906 he demonstrated that tetany could be treated successfully by transplantation of parathyroid tissue.[32]

Another colorful figure at Johns Hopkins was Joseph C. Bloodgood, a native of Wisconsin, who spent his entire professional career at the Johns Hopkins Hospital. He probably did more than anyone else to put surgical pathology on a scientific basis, and he exerted tremendous effort in the development of oncology.

Herff,[33] of San Antonio, a native of Germany, performed the first gastrostomy in America on Aug. 31, 1879, using the technique of Howse. Thompson,[34] a native of England, as the first professor of surgery at the University of Texas, did much to advance the practice of surgery. His publications on the surgical approach to the bones of the extremities, embryology, tumors of the neck and general surgical subjects are classics. His successor, Albert O. Singleton, did a great deal of work on abdominal incisions, wound disruptions, and surgery of the intestinal and lymphatic systems.[35]

More recently, intra-abdominal surgery has been greatly advanced by John M. T. Finney,[36] of Johns Hopkins, who did much to establish, on a rational basis, the surgical treatment of gastrointestinal disease. He described the pyloroplasty which bears his name. Le Grande Guerry,[37] of Columbia, S. C., emphasized early, by his own results, the feasibility of decreasing the mortality in appendicitis and penetrating wounds of the abdomen. He was the first to use ordinary cotton in subcutaneous areas. Irvin Abell of Louisville, Ky., did much to standardize gastrointestinal surgery, as did W. D. Haggard [38] of Vanderbilt University. J. Shelton Horsley,[39] a prolific writer, did much original investigative work on surgery of the gastrointestinal tract and vascular system. Frederick W. Rankin,[40] a native of North Carolina, did more than anyone else in the United States to standardize the rational treatment of diseases of the colon, and his original investigations on thyroid disease are fundamental. His contributions to the World War II effort were tremendous. Harvey Stone [41] of Johns Hopkins University made notable contributions to intestinal surgery and did fundamental work on transplantation of the thyroid and parathyroid glands.

Development of Vascular Surgery

Vascular surgery has developed tremendously in the South, possibly due to the fact that vascular injuries probably occur more often in the southern areas than in other portions of the United States. Unquestionably, the large number of patients with stab wounds admitted to the charity hospitals in New Orleans, Atlanta, and Houston offer considerable opportunity for the treatment of vascular injuries. One of the great difficulties in operating on vascular injuries and other lesions, such as aneurysms, before the introduction of asepsis, was the danger of subsequent hemorrhage. It was the custom to leave the wounds open and allow the ends of the ligatures to extend out of the wound so that they could be removed. In order to determine whether metal sutures might be used, in 1828, Levert,[42] of Mobile, Ala., did extensive investigation on animals. Acting on the suggestion of Dr. Physick that lead ligatures might be well tolerated because bullets remain in contact with

tissue for long periods of time without producing irritation, he decided to use such material. In all, he experimented with lead, gold, platinum, and rubber ligatures. He came to the conclusion that metal ligatures are well tolerated. In 1841 Dudley successfully ligated the carotid in a 25-year-old man with pulsating exophthalmos; in 1825 he ligated the subclavian artery for an axillary aneurysm.[13] In 1857 Dugas [43] operated on a boy for traumatic aneurysm of the sciatic artery, but secondary infection and severe hemorrhage developed postoperatively. Because this continued, the common iliac artery was ligated, but unfortunately the patient died. Warren Stone, of New Orleans, was the first to use a metallic ligature in 1859 when he ligated the common iliac artery for an external iliac aneurysm with silver wire. Smyth,[44] also of New Orleans, performed the first successful ligation of the innominate artery. On May 16, 1864, he ligated the innominate artery one inch above the clavicle. However, severe hemorrhage occurred, and the wound was packed with shot; six weeks later the patient almost died of hemorrhage. On July 8 the vertebral artery was ligated. The patient was apparently cured for 10 years, but then the aneurysm recurred. The internal mammary artery was ligated without benefit and an attempt to plug the openings was made, but the patient died of hemorrhage 48 hours later. On June 9, 1866, Mastin,[45] of Mobile, ligated the external iliac, 0.5 in. below the bifurcation, with a no. 32 silver wire, in a patient with an inguinal aneurysm. He repeated Levert's experiments, using metal sutures and confirming Levert's result. Although Rehn, in Frankfurt-am-Main, performed the first successful operation for cardiac injury in the human being in 1896, this operation was first successfully performed in the United States by Hill,[46] of Montgomery, Ala., the father of the illustrious senator from Alabama. At one o'clock in the morning on Sept. 9, 1902, in a rural shanty, he operated on a 13-year-old boy who had a stab wound of the heart.

Whereas the foregoing contributions to vascular surgery are of extreme importance, the greatest contributions in this field were made by Dr. Rudolph Matas of New Orleans.[47] Dr. Matas was justly designated by Dr. William Mayo as the world's best-educated physician. While an intern at the Charity Hospital in New Orleans in 1880, he assisted at the first laparotomy performed under listerian ritual, which included use of carbolic acid spray.

Dr. Matas' first endoaneurysmorrhaphy was performed on May 6, 1888, for a large traumatic aneurysm in the middle third of the brachial artery. An attempt has been made to control the aneurysm by use of compression, but the aneurysm increased in size and operation was decided on. The brachial artery was ligated in the upper third, just below the profunda and immediately above the aneurysm. Pulsation in the aneurysm ceased and the condition improved. Nine days later slight pulsation recurred, and this increased progressively until the tumor became as painful as it had been at first. Two weeks after the proximal ligation the vessel was ligated below the aneurysm with no decrease in pulsation. The aneurysm was then opened, and three openings in the aneurysmal cavity were sutured. The patient recovered completely. In commenting on this case, 10 years later, Dr. Matas made the following statement.

> At the time this operation was performed, I had no precedent to guide me, the only work that had been done, was that of Glueck, published in *Langenbeck's Archives*, in which he detailed 19 experiments in the suture of arteries which had failed to a great extent in spite of ingenious methods that he had devised. The exigencies of the case, however, made it necessary that hemostasis should be obtained, and the occlusion by suture appeared to be so easy and plain that it seemed to me that any surgeon similarly situated would have instinctively adopted the simple way of getting out of the difficulty.

In 1902 Dr. Matas presented four cases of endoaneurysmorrhaphy before the American Surgical Association. He and his associates did considerable experimental work on animals and devised an aluminum band for temporary occlusion of vessels to determine whether collaterals were sufficient. In April, 1923, he performed the first recorded aortic ligation for an aortic aneurysm. The aneurysm became quiescent, although apparently the ligation was not complete. The patient was well for more than a year but died of pulmonary hemorrhage from tuberculous cavitation. Dr. Matas also devised the hyperemic test to determine the adequacy of collateral circulation after obliteration of a vessel.

In addition to his work on the arterial system, Dr. Matas did considerable investigation on the venous system and did more than anyone in the United States to emphasize the role played by edema in the production of recurrent erysipeloid infections of the extremities. His report [48] in 1913 is still a classic and should be read by all students of the subject. He performed the first Kondoleon operation in the western hemisphere, only three months after Kondoleon's original publication in the *Zentralblatt fur Chirurgie* in 1912. Dr. Matas also did considerable work on primary thrombosis of the axillary veins and emphasized the role of effort or strain in its development. He was extremely interested in thromboembolism. He called attention to the tremendous increase in its incidence and considered it a disease associated with modern surgery.

In 1890 Branham,[49] practicing in Brunswick, Ga., described the bradycardiac reflex, which bears his name, after observing it when the blood flow through an arteriovenous aneurysm was interrupted.

Other surgeons in more recent times who have made noteworthy contributions to the treatment of vascular diseases and injuries are Mims Gage, of

Tulane University, and Dan Elkin, of Emory University, in Atlanta. Both Dr. Gage and Dr. Elkin helped standardize the treatment of traumatic and arterial aneurysms and arteriovenous fistulas. Dr. Gage also did considerable work on the systemic effects of arteriovenous anastomoses.

Still more recent research in vascular surgery has been conducted by Alfred Blalock, who began his investigations while at Vanderbilt University but who consummated these after assuming the professorship of surgery at Johns Hopkins University. In 1944 Blalock performed his first shunt operation for tetralogy of Fallot.[41] Smithy, of South Carolina, did much to rationalize the therapy of constrictive valvular disease. As early as 1950 he and his associates [50] reported eight mitral valvulotomies with only two deaths, a remarkable feat at that time.

Michael DeBakey, originally working in the experimental laboratories at Tulane University and the wards at Charity Hospital in New Orleans, did considerable fundamental work on arterial and venous diseases, and after assuming the chairmanship of the department of surgery at Baylor University, he made practical restoration of vascular continuity in patients suffering from aneurysmal and obliterative disease of the aorta and other vessels. He and his associates, more than anyone else, have standardized the technique of replacement of diseased vessels with either homogenous or synthetic grafts.

Southern Contributions to Medical Education

The South also has contributed its share to the teaching of medicine and to organized medicine. Eve, of Georgia, might well be called a peripatetic professor.[6] In 1832 he was professor of surgery at the Medical College of Georgia. Later he became professor of surgery at the University of Louisville, still later at the University of Nashville, and, finally, at the Missouri Medical College in St. Louis.

Yandell, a native of Tennessee, who returned to Louisville in 1869 to become professor of surgery at Louisville after two years' training in Europe, did much to foster publications of medical literature.[51] He started the *American Practitioner* in 1870, which he edited until 1886, when it merged with the *Medical News* to become the *American Practitioner and News*. This he edited until his death in 1898. He was president of both the American Medical Association and the American Surgical Association.

Although he is usually not considered a southerner, Gross [52] spent much of his active teaching period in the South as professor of surgery at the University of Louisville, which post he assumed in 1840, when it was the Louisville Medical Institute. He remained there for 16 years except for one year when he was professor of surgery at the University of the City of New York. He stayed at Louisville until 1856, when he accepted the position of professor of surgery at Jefferson Medical College. While in Louisville he did considerable work on diseases of the urinary tract. He wrote "A Treatise on Disease of the Urinary Bladder, the Prostate Gland and Urethra" and also "A Practical Treatise on Foreign Bodies of the Air Passage." This was the most classic article written at that time. Although the work was completed in 1859, after he returned to Jefferson Medical College, he did much of the writing on his system of surgery in Louisville. Gross was President of the American Medical Association in 1868 and was one of the founders of the American Surgical Association, of which he also became president.

McGuire of Richmond, Va., one of the founders of the Medical College of Virginia at Richmond, was extremely interested in medical education.[52] He did considerable investigation on prostatic hypertrophy. He was one of the founders of the American Surgical Association and was President of the American Medical Association in 1893.

John M. T. Finney, who was active during World War I, carried a tremendous teaching load at Johns Hopkins. He was the first president of the American College of Surgeons, one of the founders of the Society of Clinical Surgery, and president of the Southern Surgical Association in 1912 and of the American Surgical Association in 1921.

Fred Rankin was President of the American Medical Association, the American Surgical Association, and the American College of Surgeons. William D. Haggard, who made a great contribution to the war effort in World War I, was President of the American Medical Association, the American College of Surgeons, and the Southern Surgical Association.

Irvin Abell of Louisville, who did much to standardize surgery, was President of the American Medical Association, the Southern Surgical Association, and the American College of Surgeons. Dr. Matas was one of the 12 founders of the American College of Surgeons, and its president in 1925 and 1926; he received an honorary fellowship from the College in 1952. He was president of the American Surgical Association in 1900, the Southern Surgical and Gynecological Association in 1910, the American Association of Thoracic Surgery in 1920, and the International Society of Surgery in 1936. He received the first certificate of merit awarded by the American Medical Association.

From this kaleidoscopic review it is evident that the South, although more isolated than the eastern portion of the United States, has made a notable contribution to the progress of American surgery. This is a heritage in which we can have justifiable pride.

3503 Prytania St. (15).

COMMITTEE ON COSMETICS

Report to the Committee

The management of facial disfigurements has become a more acute medical problem, with greater recognition of the social and economic handicaps consequent to physical deviations from what is considered normal. It is becoming increasingly apparent that the presence of facial disfigurements, which cannot be successfully masked through cosmetic measures, more often than not may mean marginal or minority status in our society.

These pressures, added to the mass media publicity of improvements in dermatological and surgical techniques, have created a greater public demand for facial rehabilitation.

It is for this reason that the Committee sponsored the symposium, "The Management of Cutaneous Facial Disfigurements" at the 108th Annual Meeting of the American Medical Association in Atlantic City, June 9, 1959. This is the first in a series of papers that will appear in THE JOURNAL.

VERONICA LUCEY CONLEY, PH.D., *Secretary.*

DERMABRASION FOR THE IMPROVEMENT OF ACNE SCARS

Herbert Rattner, M.D.
and
Paul Lazar, M.D., Chicago

In discussing the value of dermabrasion for the improvement of acne scars, there is a temptation, generally, either to endorse it or to condemn it without qualification. In the six years since Kurtin [1] first reported on the method, it has been used on several thousand patients by a large number of physicians. Modifications and improvements have been introduced and experiences and results recorded. Still the merits of dermabrasion as a procedure are viewed with varying degrees of pessimism or enthusiasm. We believe that the method has both considerable merit and unfortunate limitations, and we undertake herein to assess it on the basis of our experience in as realistic a manner as we can.

What are the merits? It is an office procedure, and there is no need for hospitalization. There is no need for a general anesthetic. The technique is simple; it is relatively free from hazards; there is no mortality; the morbidity is tolerable, and, in well selected cases, the results are quite satisfactory and may be the source of a great deal of happiness to the patient.

Not all types of scars can be improved (fig. 1), and the unfavorable type for treatment is encountered all too frequently. Too often the results fall short of the patient's expectations, and, in such cases, if the scars were the basis for unhappiness, this unhappiness is compounded.

Our interest in the procedure was piqued some 10 years ago when we first heard of this rather startling method being used in New York City by the late Dr. Abner Kurtin. At the time, one of us (H. R.) communicated with several dermatologist-colleagues in New York whose replies were critical of the method on two grounds: the results that they had observed were disappointing, and the use of ethyl chloride, the refrigerant in use at the time, was hazardous. Besides these objections, there was the generally held view that, though unfortunate, acne scars were of not too great importance and did not warrant such drastic treatment. We did not pursue the subject, and our interest waned, though patients continued to inquire about the method. Two years later, during a meeting of the American Academy of Dermatology in Chicago, we discussed the matter with the late Dr. Rein of New York, who, like Kurtin, had been using the procedure and had found it worthwhile in many instances. He suggested a visit to New York, for he stated that the "results must be seen, they cannot be described." He generously arranged for an opportunity to watch the treatment of a few patients and to examine a number of persons who had previously been treated, in order to compare their skins with their preoperative photographs. The first impressions were mixed. The results, it appeared, hardly warranted the considerable amount of trouble involved, and yet, curiously, the patients all expressed satisfaction. This was difficult to comprehend then, just as it is today by physicians who have not themselves used this method. Later, two young women were presented, with practically flawless skin. In fact, it was a genuine surprise to be told that their skins had been planed some months previously. Their preoperative photographs showed their scars to

Professor of Dermatology (Dr. Rattner) and Assistant Professor in Dermatology (Dr. Lazar), Northwestern University Medical School

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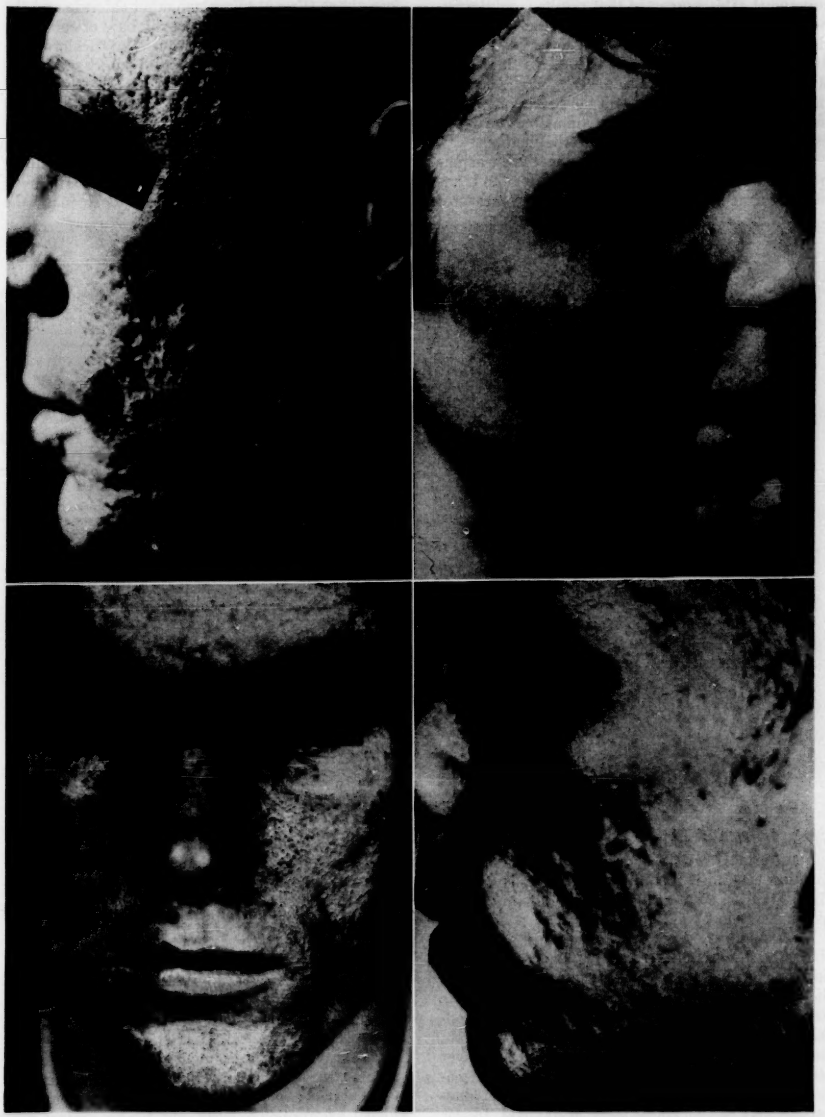

Fig. 1.—Patients with scars not likely to be helped by dermabrasion.

have been flat—like those from chickenpox, but more superficial. This suggested that results from dermabrasion might be dependent upon the shape and depth of the scars treated. An identical experience on the next day in the late Dr. Kurtin's office strengthened that impression. The satisfaction expressed by all the patients and the striking objective improvement in some of them stimulated our interest anew, and we decided to use the method.

It was evident at once that the method was unquestionably the best one yet devised for the treatment of acne scars. In the past, numerous measures had been tried, including scarification, electrodesiccation, surgical excision, surgical shaving, chemical caustics, cryoslush therapy, and the widely publicized abrasion with sandpaper, but all procedures had been found wanting.

It was evident, also, that Kurtin's most significant contribution was not the much heralded wire brush, but rather the use of ethyl chloride, for, aside from the anesthesia that was produced, ethyl chloride stiffened the skin to provide an immobile, practically bloodless operative field. This, in our opinion, constituted the real advantage of his method over others previously used. Inevitably, as more physicians gained experience with dermabrasion, innovations and modifications were introduced. In our opinion, the most valuable was the introduction by Wilson, Luikart, and Ayers [2] of dichlorotetrafluoroethane (Freon) to replace ethyl chloride and the suggestion by Hubler [3] to dot the base of each acne pit with gentian violet solution. The dichlorotetrafluoroethane, which is supplied in handy spray-type containers, carries no hazards of explosion or of inhalation, for it has no general anesthetic properties; it does away with the need for a noisy air blower, for plugging the nostrils, and for air passage tubes in the mouth, which always caused discomfort and a great deal of apprehension. Furthermore, it does not cause the dye to run and so mask the operative field. Painting the base of each scar with solution of gentian violet affords an excellent guide and guard against planing too deeply.

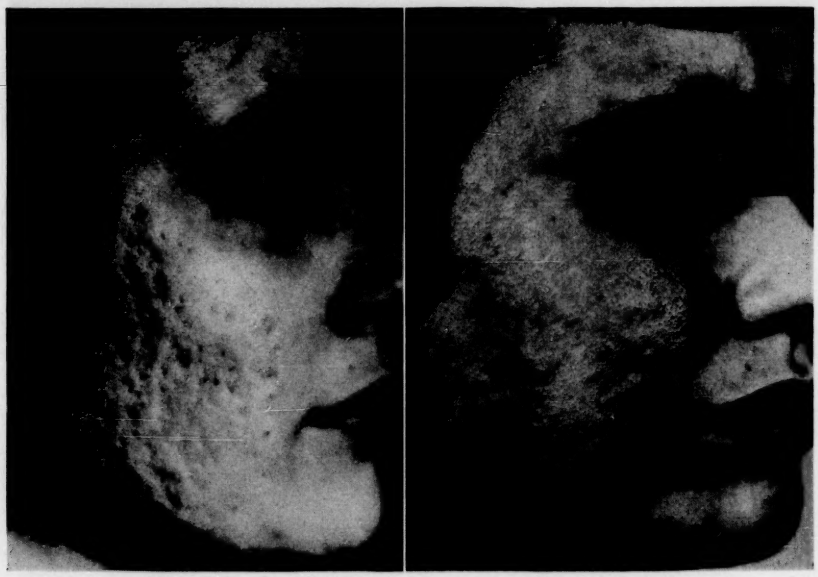

Fig. 2.—*Left*, patient before dermabrasion and, *right*, same patient after dermabrasion.

Equipment and Technique

The equipment consists of a motor-driven abrading device attached to a stand with a flexible shaft. An adjustable, removable handpiece, similar to a dentist's drill, which will hold an abrading device is attached to the shaft. A foot-operated rheostat controls the rotary speed of the abrading device.

The technique is simplicity itself. A sedative is administered 30 minutes prior to the surgery. Chilled packs, containing a 5% solution of propylene glycol, are applied to clean skin (freshly shaved, cosmetics removed) for about 20 minutes. The scalp is

covered with an operating cap or a bathing cap because, should hairs be caught in the rotary abrading device, the handpiece spring may snap. The ear canals are plugged with cotton, the eyelids covered, and the lips greased. The base of each pit is dotted with gentian violet solution to serve as a guide for planing depth. The patient is draped with a clean sheet.

A spray of rapidly volatilizing dichlorotetrafluoroethane is directed to the scarred area, and almost immediately the area becomes frosted, anesthetized, and almost rigid. A wooden tongue blade, held with the operator's free hand, permits him to apply enough tension to make the skin taut. The area is then abraded, by using short, firm strokes in a direction perpendicular to the rotating direction of the brush in order to avoid grooving. The operator then proceeds progressively from area to area until all the scars have been treated and all the gentian violet brushed away. It is better to complete the abrasion of each area with one brushing, for refreezing the skin causes an undesirable postoperative burning sensation and delayed healing. Such matters as the amount of pressure to apply, the width of the abrading brush, the angle at which to hold it, and the direction in which to guide it are all dictated by experience and judgment. As the skin thaws, blood oozes from the treated sites, but it is minimal and ceases rather quickly. Sterile dry dressings are applied until the oozing stops, after which the entire face is dressed firmly with Telfa dressings, and the patient is sent on his way. In that few minutes' period between the brushing and the bandaging, there is a considerable but tolerable burning sensation.

The patient is instructed to remove the bandage and dressings 24 hours later at home and to expect that by then the bandage will be bloodstained, the face swollen considerably, and that serum may exude for an hour or two, then dry into crusts which will begin to drop off in six or seven days. A prescription for Empirin with codeine is supplied, should headache develop. The face may be washed at any time after the first 24 hours but should be dried by blotting rather than by rubbing with a towel. When the crusts have all dropped off (usually about 10 days to 2 weeks), women may use their cosmetics and men their electric razors and resume their occupations.

Sometimes vellus hairs prevent the crusts from falling; in such cases, the application of a petrolatum dressing will remove the crust. Most patients find the experience to be much less formidable than they had expected. Some, of course, find it traumatic, the number of patients, in our experience,

Fig. 3.—*Left*, appearance of skin before dermabrasion and, *right*, after, in same patient.

being almost directly proportional to the amount of admonition and postoperative instructions issued to them.

Complications

The complications are infrequent and are usually unimportant. Impetigo, readily controlled with antibiotic agents, may occur in the first two weeks. Milia may appear weeks later; emptying them hastens their involution, but most disappear in time. More rarely, postoperative erythema may persist for several months instead of for the usual three or four weeks. This may be due to excessive refrigerations, overexposure or premature exposure to sunlight after the operation, or overly vigorous cleansing. In unusual cases and particularly in dark-complexioned persons, hyperpigmentation, especially at the edges of the abraded area, develops and may persist for months. This is an unhappy experience because the patient who is seeking relief from a cosmetic defect is disturbed by another. The appearance of a postoperative eczematous patch has been reported as a complication of dermabrasion; we have not observed it. In one instance, we have observed the development of two small hypertrophic scars, one of which was treated, the other not, and both disappeared. Though we have heard of a few instances of true keloids developing after abrasion, we ourselves have not observed any.

Results

The results from dermabrasion cannot be assessed in precise mathematical terms. Unfortunately, in the beginning, the limitations of the treatment were not fully realized, and inevitably the technique was both abused and misused. Most unfortunate were the unduly glowing reports that appeared in some lay publications, so that in far too many instances the outcome was disappointing.

Since then, planed skin has been subjected to thorough clinical and microscopic studies to determine the effects from refrigeration and the physiological processes of epithelial regeneration.[4] Much thought has also been given to the psychological aspects of the problem.

Fig. 4.—*Left*, scars seen before dermabrasion and, *right*, improvement seen afterward, in same patient.

The results from treatment depend a good deal upon the shape and depth of the scars and also upon the skill of the operator. Superficial flat-surfaced scars with abrupt edges respond exceptionally well to treatment; the wide, ill-defined, confluent scars that impart an undulating appearance to the skin, less so; the deep-pitted, so-called ice-pick type of scars, practically not at all; and, of course, widened or patulous pores cannot be narrowed. The latter type of skin, i. e., the leathery skin with deeply pitted, narrow scars interspersed with innumerable wide pores, occurs all too frequently and often produces the most severe cosmetic defect,

so that, unfortunately, the person with the greatest need for help obtains the least amount of benefit from dermabrasion.

Scars on the cheeks and, to a lesser degree, scars on the forehead and temples respond best to dermabrasion because of the rich supply in these areas of pilosebaceous units from which regeneration is stimulated. Scars on the chest, back, shoulders, and neck respond poorly. Scars of recent origin appear to respond better than do old scars. The age of the patient is not important, and the presence of a few acne lesions need not deter one from treatment. It is best to abrade all scars at one time rather than small areas at spaced intervals.

Aside from the aforementioned complications which occur rarely, the procedure is a safe one in careful hands. If care is given to the selection of the person to be treated, as well as to the shape and depth of the scars, the procedure can be a satisfying one for all concerned. Practically all patients benefit from the treatment to some degree (fig. 2, 3, and 4); not all benefit as much as they would like. The emotionally disturbed person who attributes his or her unhappiness to the acne scars is certain to be displeased with the result—as is the perfectionist with barely noticeable scars who wants to have the skin of a baby. The emotionally mature, reasonably intelligent person who will accept improvement short of "cure" is the most satisfactory patient. Almost all of them, however, show some measure of anxiety, fear, and uncertainty when they come to consult about the procedure. It is well, therefore, to discuss the matter with the patient in the presence of a relative. The technique and the postoperative course should be fully described, and the likelihood that the results may fall short of the patient's expectations should be mentioned several times. It is tempting fate to try to foretell the amount, percentage-wise, of improvement to be expected from treatment. In some cases it may be desirable to repeat the treatment once or twice after an interval of eight months or more. It is well, too, for the patient to consider all the factors for several days before deciding to undergo the treatment. It is highly desirable that a preoperative photograph be taken in every case and made a part of the record. The degree of improvement may then be appreciated by surgeon and patient alike.

Conclusion

A realistic appraisal of the method would indicate that dermabrasion for the improvement of acne scars can be a rewarding experience for both the physician and the patient, provided the patient is selected with great care and the scars are assessed critically with regard to their shape, depth, and location and provided also that the patient will accept improvement that is short of a perfect result. In such cases, the vast majority of patients are pleased with the results, often more so than the physicians. The cosmetic improvement and, in particular, the improved well-being of the patient are such as to indicate that physicians take too lightly the importance of acne scars to the patient. We are constantly impressed by the numbers of mature men and women who seek the treatment and assure us that even a slight amount of treatment would be most welcome and worth the effort. On the other hand, it would be folly to undertake dermabrasion in order to cure emotional disturbances occasioned by acne scars. Unfortunately, the person with a leathery, pitted, wide-pore type of skin, most anxious for and most in need of help, gets practically none from dermabrasion.

104 S. Michigan Ave. (3) (Dr. Rattner)

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THE CERVICAL MUCUS DURING OVULATION.—Spinnbarkeit is a characteristic of the cervical mucus which, as its name signifies, indicates the ability of the mucus to be drawn out into a very fine thread after having been removed from the cervix with a glass cannula. The material is blown out onto a glass slide and a coverslip placed on it. By lifting the coverslip off the slide several times the length of the thread of mucus which is formed can be measured without difficulty and the average length can be obtained. At the time of maximal production of cervical mucus, which closely parallels the time of ovulation and which also closely parallels the time of maximal estrogen production by the ovarian follicles, the spinnbarkeit reaches a length of from 10 to 20 cm.; at other times, particularly just before ovulation, it will be impossible to draw out a thread longer than 1, or 2 cm. at the most.—G. C. Douglas, M.D., Is There a Routine Cervical Smear? *The American Surgeon,* October, 1959.

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LIFE IN A TEST TUBE AND ELSEWHERE

A few weeks ago, on Nov. 24 to be exact, nine eminent dentists from this country and abroad sat on a panel at the University of Chicago to review certain facts known by members of their guild and to exchange opinions on the origin of life. This rare and deservedly widely publicized occasion was the 100th anniversary of Charles Darwin's book, "The Origin of Species." A scientifically minded audience from far and near filled Mandel Hall, hoping no doubt to learn from where and how they came to be there.

The panelists probably expressed their biochemical, astronomical, and genetic ideas in terms as simple as possible. Still the imagination of the audience at times was strained, and the energy expended by the panelists themselves apparently was such that the chairman considered it advisable to have a short recess in the middle of the session for everyone to recuperate. Perhaps when evolution has advanced far more than it has at present, the average homo sapiens will be more at home with such terms as "billions of years ago" and "the hundred thousand million billion stars." The panelists probably had digested *in toto* many technical documents and had endured long periods of observation and experimentation to come forth with these inordinate figures. Nevertheless, they did point out rather simply that Darwinian evolution is not a theory any more, but a fact, and that long, long ago some of the first organic compounds were of such kinds that they could readily be transformed into parts of living things.

To the question of what life is, a panelist said that the most fundamental property distinguishing a living thing and that can be used to define life is its ability to form copies of itself. "We call it reproduction but the copies must even include innovations which we call mutations, that distinguish the given living thing from its parents. It is this property of not merely reproducing itself by even reproducing its types that has inevitably led the first multiplying object to go through the three, four, or five billion years of gradual evolution with which all present day living things, including ourselves, have gradually taken shape under the directing influence of natural selection."

Another panelist said that from the standpoint of the composition of living things, when we reach a point where we all agree that it is living, we always find three components at that level. "We find proteins, nucleic acids, and some sort of energy source; the third component is the necessary one, because the system of organization is the essence of the living cells. We know that the living thing is essentially unstable and so these components are not unique characteristics of living things. Other actions happen too, but when we find life we find all of these three components there."

So far as this pre-Darwinian idea is concerned, one speaks of viruses. The virus is, in certain manifestations, difficult to define as being either living or nonliving. In their isolated stage, viruses do not show any source of energy, for example, and from that standpoint they are nonliving. When one introduces a virus into the host cell, it replicates. It uses the machinery of the host cell. Under these circumstances, it is able to communicate and replicate. One might say, therefore, that under these circumstances not the virus but the virus and host cell together form a living system; but this is no answer to the question of what is living or nonliving. The exchange of opinions continued, but there was no agreement on an exhaustive definition of what life is.

Nucleic acid was given further consideration, particularly the large multicolored model (on a stand) of the nucleic acid molecule. The tendency at present, it seems, is to identify desoxyribose nucleic acid, one of the two types of nucleic acid, with the genetic material itself, that is, the genes. Ribonucleic acid, the other type of nucleic acid, is present in the cytoplasm of cells, and the two types are distinguished by the nature of the sugar they have in them.

The Urey-Miller experiment is widely known to scientists and its importance is appreciated, but it was news to some and perhaps to many of those in Mandel Hall. Prof. Harold C. Urey conceived a hypothesis, and Dr. Stanley Miller of the University of Chicago a few years ago put it to the test and proved it to be true. Miller subjected to electrical discharges a mixture of hydrogen and water vapor, ammonia, and methane, and he thus produced a number of amino acids, which are the building blocks of proteins, which are the building blocks of living matter.

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Near the close of the two-hour session written questions were sent up from the audience, and one that the chairman preferred was "Please poll the panel for their opinion of the estimate that life can be created in test tubes in 1,000 years." One panelist said that in terms of a replicating and mutating macromolecule, it is quite possible in 1,000 years; another thought that perhaps we will make it in 500 years; another was confident that it would be solved during his lifetime (perhaps 20 or 30 years); and another estimated that it would be done before the end of the century. Then, perhaps, came a shock, when a geneticist said, "My answer is that . . . defining life as I do, the most primitive forms of things which deserve to be called living have already been made in the test tube."

Four other panels participated in this great celebration discussing various phases of evolution, and if they were similarly adept it would seem that more favorable mutations must be awaited before scientists agree on many of these questions.

ARE YOU AWARE?

The warning to "beware" or be "on the alert" will cause the thoughtful physician to slow his pace and possibly ponder the reason for the admonition. Should the unsuspecting physician be inattentive to the remonstrance, in some instances, it may cause him to contemplate seriously the consequences.

Over the generations as well as over the centuries of human activity, mental capacity for planning and mental capacity for initiating fortunately persist. If Aristotle or Plato could be exposed to the environment of 1959 in medicine, physics, radiobiology, or enzyme chemistry, to mention only a few scientific disciplines, there is little doubt but that either would be sufficiently skilled to be a leader in his field of endeavor or a professor in his department in the university. If these men were now in such positions of responsibility, the influence of their thoughts and actions undoubtedly would be profound. But we are now in the waning hours of 1959. Looking to 1960, we should take heed of the past and be on the alert for continued change in the future. Those physicians who have been aware must have appreciated the effectual attempts at integration of the diverse activities at the American Medical Association headquarters, under the authority of the Board of Trustees and the House of Delegates.

New leadership in several of the Divisions and sympathetic but forthright and aggressive guidance at the helm are welcome attributes at 535 N. Dearborn St. Each participant is dedicated to the premise that the future course of events for American medicine is critical for all interested parties. As we look ahead we see that the impetus makes it inevitable that the evolution will continue slowly and surely in the Association that represents the physicians of this country. A new facade is on the building, there are new faces in the offices, and new philosophies are widely apparent. We are convinced that the transformation and metamorphosis will be a tremendous force for the good in the immediate future as well as for many years hence in American medicine.

JOURNAL INDEX

The index to volume 171 of THE JOURNAL will appear in the Jan. 9, 1960, issue. Those who wish extra copies of the index may receive them, without charge, on request to the Circulation and Records Department, American Medical Association, 535 N. Dearborn St., Chicago 10.

ORGANIZATION SECTION

SUMMARY OF THE DALLAS MEETING

Freedom of choice of physician, relations between physicians and hospitals, a scholarship program for deserving medical students, and relative value studies of medical services were among the major subjects acted on by the House of Delegates at the American Medical Association's 13th Clinical Meeting held Dec. 1-4 in Dallas.

Dr. Chesley M. Martin of Elgin, Okla., was named as the 1959 General Practitioner of the Year for his outstanding contributions to the health and civic affairs of his home community. Dr. Martin, who has practiced in Elgin for the past 44 years, was the 13th recipient of the annual award and the first Oklahoman to be so honored.

Speaking at the Tuesday opening session of the House, Dr. Louis M. Orr of Orlando, Fla., A. M. A. President, urged the nation's physicians to take a more active interest in the whole area of politics, public affairs, and community life. Dr. Orr also asked physicians and medical societies to do a more effective job of telling medicine's positive story, adding that "if more people knew more about the things we support and encourage, they would listen to us much more carefully about those occasional things that we oppose."

Two nationally known political leaders from Texas also addressed the Tuesday morning session. Sen. Lyndon B. Johnson, majority leader in the U. S. Senate, called for a "politics of unity" which will enable Americans to exert strength and deter-

mination in an effort to create a world in which all men can be free. Speaker of the U. S. House of Representatives Sam Rayburn urged greater attention to the task of educating young people in the principles of American government and giving them a desire to perpetuate it.

Total registration through Thursday, with half a day of the meeting still remaining, had reached 4,727, including 2,742 physicians.

Freedom of Choice

In considering four resolutions which in various ways would have changed or replaced the statements on freedom of choice of physicians which the House adopted in June, 1959, when acting on the recommendations in the report of the Commission on Medical Care Plans, the House reaffirmed the following two statements approved in Atlantic City:

1. "The American Medical Association believes that free choice of physician is the right of every individual and one which he should be free to exercise as he chooses."

2. "Each individual should be accorded the privilege to select and change his physician at will or to select his preferred system of medical care, and the American Medical Association vigorously supports the right of the individual to choose between these alternatives."

However, in order to clarify and strengthen its position on the issue of freedom of choice of physician, the House also adopted this additional statement which was submitted as a substitute amendment on the floor of the House:

3. "Lest there be any misinterpretation, we state unequivocally that the American Medical Association firmly subscribes to freedom of choice of physician and free competition among physicians as being prerequisites to optimal medical care. The benefits of any system which provides medical care must be judged on the degree to which it allows of, or abridges, such freedom of choice and such competition."

Near the conclusion of the discussion it was emphasized that the amendment was intended to strengthen the position stated last June, not to modify or retract such position.

Physician-Hospital Relations

The House received 12 resolutions on the subject of relationships between physicians and hospitals. To resolve any doubt about its position, the House did not act on any of the resolutions but instead reaffirmed the 1951 "Guides for Conduct of Physicians in Relationships with Institutions." It also declared that "all subsequent or inconsistent actions are considered superceded."

It was recommended and accepted also that (1) the House of Delegates acknowledge the need to strengthen relationships with hospitals by action at state and local levels, (2) the Board of Trustees of the Association continue to maintain liaison with the Board of Trustees of the American Hospital Association, and (3) the Council on Medical Service review this entire problem to ascertain if there have been actions inconsistent with the 1951 Guides.

Those Guides summarize the following general principles as a basis for adjusting controversies:

"1. A physician should not dispose of his professional attainments or services to any hospital, corporation, or lay body by whatever name called or however organized under terms or conditions which permit the sale of the services of that physician by such agency for a fee.

"2. Where a hospital is not selling the services of a physician, the financial arrangement if any between the hospital and the physician properly may be placed on any mutually satisfactory basis. This refers to the remuneration of a physician for teaching or research or charitable services or the like. Corporations or other lay bodies properly may provide such services and employ or otherwise engage doctors for those purposes.

"3. The practice of anesthesiology, pathology, physical medicine, and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine, or any other designated field of medicine."

Scholarship Program

To help meet the need for an increased number of physicians in the future, the House approved the creation of a special study committee which was asked to:

1. Present a scholarship program, its development, administration and the role of the American Medical Association in fulfilling it.

2. Ascertain the maximum to which medical schools could expand their student enrollment and maintain the high quality of medical education.

3. Ascertain what universities can support new medical schools with qualified students and sufficient clinical material for teaching—either on a two-year or a full four-year basis.

4. Investigate the securing of competent medical faculties.

5. Investigate financing of expansion of existing facilities and establishment of new medical schools.

6. Investigate financing of medical education in order to ascertain the most economical methods for procuring the highest quality of medical training.

7. Develop methods of recruiting well-qualified students to undertake the study of medicine.

8. Investigate the possibility of relaxing rigid geographical restrictions of medical schools for the admission of students.

The House urged that the special committee be implemented with adequate funds and staff promptly so that it may make an initial report by June, 1960.

Relative Value Studies

Reaffirming a previous policy statement, the House approved in principle the conducting of relative value studies by each state medical society, rather than a nationwide study or a series of regional studies by the A. M. A. The House also reiterated its authorization for the Committee on Medical Practices to inform each state medical association, through regional or other meetings, of the

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purpose, scope and objectives of such studies, the steps to be followed in conducting studies, the problems which may be encountered, and the manner in which the results can be applied.

The House recognized, however, that some state medical societies either are not interested in relative value studies or are actively opposed to them. It pointed out that some state medical associations fear that the regional conferences of the Committee on Medical Practices will put pressure on them to carry out such studies and that this will result in the adoption of "fixed fees."

Since the regional conferences are educational in nature, the House affirmed that: It is the obligation of each state or county medical association to accept or reject the idea of a study in its area.

The House was aware that this subject matter remains controversial. However, it commended the Committee on Medical Practices for its effort to carry out the instructions of the House, and it urged the committee to continue its educational work.

Miscellaneous Actions

In considering 44 resolutions and a large volume of annual, supplementary and special reports, the House also was informed that the A. M. A. Board of Trustees has appointed a liaison committee to meet with a similar committee of the American Osteopathic Association to consider matters of common concern; emphasized that local medical societies should insure that no member violates ethical traditions as they relate to ownership of pharmacies or stock in pharmaceutical companies; approved the plan of the Committee on Medical Rating of Physical Impairment to publish its new guide on the cardiovascular system in THE JOURNAL; recommended that Association councils and committees, whenever feasible, hold their meetings in the remodeled Chicago headquarters; called for investigation of the need, desirability, and feasibility of establishing a home for aged and retired physicians; commended Dr. F. S. Crockett, retiring chairman of the Council on Rural Health, for his many years of devoted duty; urged active promotion and careful study of the newly developed "Guides for Medical Care in Nursing Homes and Related Facilities"; suggested that fees for consultative examinations under programs of the Bureau of Old Age and Survivors Insurance should be adjudicated directly between the state medical society and the state agency involved; registered a strong protest to the Veterans Administration and urged strict screening of non-service-connected disability patients admitted to government hospitals; reiterated the Association's support of the Blue Shield concept and directed the Council on Medical Service to submit at the June, 1960, meeting its recommendations concerning a policy statement on A. M. A. relationship with Blue Shield plans; suggested that S. J. Res. 41, a bill which would institute a separate program of international medical research, be delayed until an over-all assessment can be made of proposals now before Congress dealing with domestic and international medical research; endorsed the program of the Educational Council for Foreign Medical Graduates but also urged that judicious consideration be given to local problems involved in the July 1, 1960, deadline for certification of foreign graduates; urged that medical schools include in their curriculums a course on the social, political, and economic aspects of medicine; declared that the threat of nuclear warfare has imposed a tremendous responsibility on the medical profession, which must be prepared to assume a critically important role in such an event; suggested that the A. M. A. make available to school libraries information and literature showing the advantages of private medical care and the American free enterprise system; stated that examinations to determine the physical and mental fitness of aircraft crew members should be made by doctors of medicine with special knowledge and proficiency in certain techniques; urged the American people to receive proper tetanus toxoid, original and booster, and other immunizations as indicated from their physicians, and called on A. M. A. members to cooperate in an educational program on tetanus immunization; recommended that all state and county medical societies establish programs for the inspection and testing of fluoroscopes and roentgenographic equipment; approved the Speaker's proposal that the opening session of the House, at the Interim Meeting, be moved from Tuesday morning to Monday morning, with the reference committees meeting on Tuesday and the House reconvening on Wednesday afternoon; called on each individual physician to wage "a vigorous, dynamic, and uncompromising fight" against the Forand type of legislation; urged state and local medical societies and individual physicians to implement the A. M. A. program for recruitment of high-grade medical students; changed the title of the Section on Surgery, General and Abdominal, to the Section on General Surgery; accepted with appreciation a $2,500 contribution by Smith Kline and French Laboratories toward establishment of a suitable award honoring the name of Dr. Thomas G. Hull, retiring secretary of the Council on Scientific Assembly; and reaffirmed the "Suggested Guides to Relations Between Medical Societies and Voluntary Health Agencies," which were adopted at the December, 1957, meeting in Philadelphia.

At the Tuesday opening session, six state medical societies presented nearly $250,000 to the American Medical Education Foundation. The moneys accepted by Dr. George F. Lull, president of AMEF, were: California, $156,562; Indiana, $35,570; New York, $19,546; Utah, $10,355; New Jersey, $10,000; and Arizona, $9,263.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

SUPPLEMENTARY LIST—CORRECTIONS

In the annual Internship and Residency Number of THE JOURNAL, *Oct. 10, 1959, incomplete or inaccurate data were presented. The correct entries are as follows.*

In addition to publishing the Directory of Approved Internships and Residencies in the Internship and Residency Number annually, it is planned to publish newly approved programs on a quarterly basis. The first such quarterly list is scheduled for January, 1960.

Approved Residencies and Fellowships

INTERNSHIPS

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
Baltimore City Hospitals [1-2-4-X38-x37] 4940 Eastern Ave., Baltimore 24, Md.	City	1,140	12,140	Req	73	12	157	125FM	12 Rotating General	23711
									10 Straight Medicine	23732
									6 Straight Surgery	23733
									3 Straight Pediatrics	23734
									1 Straight Pathology	23736
									2 Mixed (Med.-Ped.)	23753
									2 Mixed (Ped.-Med.)	23754
Mount Auburn Hospital [1-3-x40] 330 Mt. Auburn St., Cambridge 38, Mass.	NPCorp	248	8,235	Req	56	12	288	120FM	4 Mixed (Med.-Surg.-Ped.)	26923
Watts Hospital [1-3-x63-64] Broad St. and Club Blvd., Durham, N. C.	NPCorp	293	11,095	Req	39	12	No	250FM	10 Rotating General	87711
									3 Rot. Med. Major	87712
									2 Straight Medicine	87732
									1 Straight Ob.-Gyn.	87735
Rhode Island Hospital [1-3-4] 593 Eddy St., Providence 2, R. I.	NPCorp	659	19,395	Req	41	12-24	250	100FM	18 Rotating General	67711

Affiliations as Referred to in Column Headed: "Affiliated Service"

288. Boston Lying-In Hospital, Boston

ANESTHESIOLOGY

Residency programs in the following hospitals have been approved for TWO years of training by the Council and the American Board of Anesthesiology, through the Residency Review Committee for Anesthesiology.

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First-year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Veterans Admin. Hospital [1-3-158]	Hines, Ill.	M. Sadove	3,080	1,739	4	7	270
University Hospital [1-3]	Baltimore	M. Helrich	7,914	5,104	6	14	275
St. Joseph's Hospital	Far Rockaway, N. Y.	R. H. Berman-J. Turbin	...	...	..	..	...

DERMATOLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First-year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
University Hospital [1-3]	Baltimore	H. M. Robinson Jr.	250	10,733	2	6	3	200

GENERAL PRACTICE

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
University Hospital [1-3]	Baltimore	G. Entwisle	Incl. in Int. Med.		2	3	2	200

INTERNAL MEDICINE

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Baltimore City Hospitals [1-3]	Baltimore	G. S. Mirick	1,591	138	4	9	3	200
University Hospital [1-3]	Baltimore	T. E. Woodward	3,597	198	19	33	3	200
Methodist Hospital [1-3]	Minneapolis	D. R. Hastings	2,686	77	1	1	1	200
St. Luke's Hospital [1-3]	New York City	T. B. Van Itallie	3,130	119	8	15	3	100
Baptist Memorial Hospital [1-3]	Memphis, Tenn.	P. Milnor Jr.	10,835	124	2	5	1	325

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NEUROLOGICAL SURGERY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend (Month)
Medical College of Georgia Hospitals	...	...	...	...	...	...	4	...
Eugene Talmadge Hospital [1-3]	Augusta, Ga.	G. Smith	343	14	1	5	..	250
University Hospital [1-3]	Augusta, Ga.	P. Nichols	628	12	1	1	..	200
Veterans Admin. Hospital [1-3]	Augusta, Ga.	...	...	...	...	...	..	...
Johns Hopkins Hospital [1-3]	Baltimore	A. E. Walker	790	25	2	6	4	25
Baltimore City Hospitals [1-3]	Baltimore	J. D. McQueen	233	10	..	1	..	225
University Hospital [1-3]	Baltimore	J. G. Arnold	872	48	1	6	4	200

NEUROLOGY

Residency programs in the following hospitals have been approved for THREE years of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level.)

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend (Month)
Baltimore City Hospitals [1-3]	Baltimore	J. W. Magladery	741	56	2	3	300
University Hospital [1-3]	Baltimore	C. Van Buskirk	307	15	2	3	300
University of Vermont College of Medicine Affiliated Hospitals	Burlington, Vt.	G. A. Schumacher	420	15	1	3	330
De Goesbriand Memorial Hospital [1-3]	Burlington, Vt.	H. Martin	...	..	..	..	...
Mary Fletcher Hospital [1-3]	Burlington, Vt.	G. A. Schumacher	...	..	..	..	...

OBSTETRICS—GYNECOLOGY

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend (Month)
Baltimore City Hospitals [1-3]	Baltimore	P. E. Molumphy	OBG	6,603	8	6	18	3	125
University Hospital [1-3]	Baltimore	A. L. Haskins	OBG	4,918	9	6	15	3	200

OPHTHALMOLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend (Month)
Cleveland Metropolitan General Hospital [1-3]	Cleveland	R. J. Nicholl	115	4,900	1	4	3	150
St. Luke's Hospital [1-3]	Cleveland	G. T. Schwarz	411	4,759	..	..	..	200

ORTHOPEDIC SURGERY

Type of training acceptable to Board: A—Adult Orthopedics; C—Children's Orthopedics; F—Fractures. Residency programs in the following hospitals have been approved by the Council and the American Board of Orthopedic Surgery, through the Residency Review Committee for Orthopedic Surgery, as offering acceptable training in adult orthopedics, children's orthopedics, and fractures. Training in the basic sciences is given either as an integral part of these services or as a separate course. Services collaborating in an integral plan of training are designated by a program number.

Residents completing their training in these hospitals are eligible for full certification by the American Board of Orthopedic Surgery, including children's orthopedic surgery.

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend (Month)
Baltimore City Hospitals [1-3]	Baltimore	R. A. Robinson	AF	87	332	3	..	1	125
University Hospital [1-3]	Baltimore	A. F. Voshell	AF	88	349	1	1	3	200

OTOLARYNGOLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatients Visits	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend (Month)
University Hospital [1-3]	Baltimore	C. L. Blanchard	341	4,817	2	6	250
University of Kansas Medical Center [1-3]	Kansas City, Kan.	G. O. Proud	831	13,375	1	4	125
Veterans Admin. Hospital [1-3-29]	Kansas City, Mo.	H. A. Knauff	252	3	..	..	271

PATHOLOGY

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend (Month)
San Joaquin General Hospital [1]	Stockton, Calif.	H. J. Schneider	433	148,299	2,722	2,241	1	1	3*	360
Veterans Admin. Hospital [1-3-18]	Hines, Ill.	M. Rubnitz	625	619,930	3,878	3,693	4	10	4*	270
Baltimore City Hospitals [1-3]	Baltimore	A. D. Pollack	479	165,829	2,958	2,958	2	5	3*	125
University Hospital [1-3]	Baltimore	H. J. Firminger	461	455,576	7,630	7,630	2	8	4*	350
Holy Cross Hospital [1-3]	Salt Lake City	C. McNeil	132	123,654	5,980	5,112	1	1	4*	275

PEDIATRICS

Residency programs in the following hospitals have been approved by the Council, the American Academy of Pediatrics and the American Board of Pediatrics, through the Residency Review Committee for Pediatrics, as offering full training in the specialty: (i. e., TWO or more years).

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend [4] (Month)
Duval Medical Center [1-3]	Jacksonville, Fla.	J. K. David Jr.	518	18	2	4	200
St. Vincent's Hospital [3]	Jacksonville, Fla.	H. A. Carithers	2,668	15	1	2	325
Baltimore City Hospitals [1-3]	Baltimore	H. E. Harrison	1,786	185	3	6	125
University Hospital [1-3]	Baltimore	J. E. Bradley	1,373	87	3	7	200

PHYSICAL MEDICINE AND REHABILITATION

Name of Hospital	Location	Chief of Service	Inpatients Treated	Number of Treatments	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend [4] (Month)
Bellevue Hospital Center								
Div. III—New York University College of Medicine [1-3-259]	New York City	H. Rusk	17,122	111,873	..	15	3	145
Hospital for Joint Diseases [1-3]	New York City	A. S. Russek	2,086	22,856	..	..	..	80

PSYCHIATRY

Residency programs in the following hospitals have been approved for THREE years of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology.

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend [4] (Month)
Veterans Admin. Hospital [1-3-154]	Hines, Ill.	L. Jensen	25	729	4	4	12	320
University Hospital [1-3]	Baltimore	J. E. Finesinger	..	908	1	7	15	275

PULMONARY DISEASE

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend [4] (Month)
Essex County Sanatorium [1-3]	Verona, N. J.	I. Ocheret	992	28	2	4	577.83

RADIOLOGY

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend [4] (Month)
Veterans Admin. Hospital [1-3-148]	Hines, Ill.	F. Hussey	69,657	698	11,079	346	6	12	270
Baltimore City Hospitals [1-3]	Baltimore	J. De Cario	32,426	7	810	157	1	4	125
University Hospital [1-3]	Baltimore	J. M. Dennis	59,836	148	10,755	...	2	7	250
University of Texas Southwestern Medical School Affiliated Hospitals Parkland Memorial Hospital [1-3]	Dallas, Texas	F. Bonte	48,686	57	2,475	775	2	7	150

SURGERY

Residency programs in the following hospitals have been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for FOUR OR MORE years of training, designed to qualify the trainee for examination by the American Board of Surgery as a Group I candidate.

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Beginning Stipend [4] (Month)
Baltimore City Hospitals [1-3]	Baltimore	M. M. Ravitch	1,044	59	6	17	125
University Hospital [1-3]	Baltimore	R. W. Buxton	2,989	72	10	23	200

Residency programs in the following hospitals are approved by the Council as offering satisfactory training of ONE or TWO years' duration in preparation for residency training in the surgical specialties only. Applicants intending to qualify for examination by the American Board of Surgery should refer to the lists of approved services on pages 774 through 781 (Surgical Residencies, J. A. M. A. 156-432, Sept. 25, 1954).

St. Bernard's Hospital	Chicago	E. A. Balcer	...	..	..	..	...

THORACIC SURGERY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered [4]	Total Residencies Offered [4]	Length of Approved Program (Years)	Beginning Stipend [4] (Month)
University Hospital [1-3]	Baltimore	R. A. Cowley	277	16	3	7	2	200

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UROLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First-year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Indiana University Medical Center [434]							
Indiana University Medical Center Hospital [1]	Indianapolis	R. A. Garrett	325	6	2	8	225
Marion County General Hospital [1-3]	Indianapolis	R. D. Howell	370	14	1	4	210
Veterans Admin. Hospital [1-3]	Indianapolis	R. A. Garrett	624	177	..	..	271
Methodist Hospital [1]	Indianapolis	M. H. Nourse	2,225	8	1	2	278
University Hospital [1-3]	Baltimore	J. D. Young Jr.	851	15	2	6	200

NUMERICAL AND OTHER REFERENCES

289. City Hospital at Elmhurst, Goldwater Memorial Hospital, Institute of Physical Medicine & Rehabilitation, Montefiore Hospital, St. Barnabas Hospital, St. Vincent's Hospital, University Hospital, Veterans Admin. Hospital (Manhattan), New York City; Grasslands Hospital, Valhalla, N. Y., New York State Rehabilitation Hospital, West Haverstraw, N. Y.

434. Methodist Hospital, Indianapolis.

APPROVED RESIDENCY TRAINING PROGRAMS

Name	Location	Approved Residencies
Orange County General Hospital *	Orange, Calif.	Int. Med., Rad.
Palo Alto-Stanford Hospital Center *	Palo Alto, Calif.	Anes., Derm., Int. Med., Neur., Ob.-Gyn., Otol., Ortho. Surg., Path., Ped., Psych., Rad., Surg.
Methodist Hospital *	Minneapolis	Int. Med.
St. Barnabas Hospital	Minneapolis	Int. Med., Ob.-Gyn., Path., Surg.
Christ Hospital *	Cincinnati	Anes., Gen'l Pract., Int. Med., Neuro. Surg., Plas. Surg., Surg.
State of Connecticut Vet. Home and Hospital	Rocky Hill, Conn.	Phys. Med.
Laurel Heights Hospital	Shelton, Conn.	Pul. Dis.
Stamford Hospital *	Stamford, Conn.	Path., Surg.
Charlotte Hungerford Hospital	Torrington, Conn.	Gen'l Pract.
St. Mary's Hospital *	Waterbury, Conn.	Anes., Int. Med., Path., Rad., Surg.
Waterbury Hospital *	Waterbury, Conn.	Int. Med., Path., Ped., Rad., Surg., Urol.
State of Delaware	Dover, Del.	Pub. Health
Delaware State Hospital	Farmhurst, Del.	Psych.
Alfred I. Du Pont Institute of Nemours Foundation	Wilmington, Del.	Ortho. Surg.
Delaware Hospital *	Wilmington, Del.	Card. Dis., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Memorial Hospital *	Wilmington, Del.	Int. Med., Path., Surg.
Wilmington General Hospital *	Wilmington, Del.	Gen'l Pract., Int. Med., Ob.-Gyn., Path.
Armed Forces Institute of Pathology	Washington, D. C.	Path.
Army Medical Center (Walter Reed Army Hospital) *	Washington, D. C.	Allergy, Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Children's Hospital	Washington, D. C.	Neuro. Surg., Path., Ped. Allergy, Ped., Psych., Surg.
Columbia Hospital For Women and Lying-in Asylum	Washington, D. C.	Ob.-Gyn.
District of Columbia General Hospital *	Washington, D. C.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Psych., Pul. Dis., Rad., Surg., Urol.
Doctors Hospital *	Washington, D. C.	Int. Med., Ob.-Gyn., Path., Rad., Surg.
Eastern Dispensary and Casualty Hospital	Washington, D. C.	Surg.
Freedmen's Hospital *	Washington, D. C.	Card. Dis., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Ped., Psych., Pul. Dis., Rad., Surg., Urol.
Georgetown University Hospital *	Washington, D. C.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
George Washington University Hospital *	Washington, D. C.	Anes., Card. Dis., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Path., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg.
Providence Hospital *	Washington, D. C.	Anes., Int. Med., Ob.-Gyn., Path., Surg.
St. Elizabeth's Hospital *	Washington, D. C.	Psych.
Sibley Memorial Hospital *	Washington, D. C.	Ob.-Gyn., Path., Surg.
Tuberculosis Sanatorium (Glenn Dale, Md.)	Washington, D. C.	Pul. Dis.
Veterans Admin. Hospital	Washington, D. C.	Int. Med., Neur., Ophth., Path., Rad., Surg., Urol.
Washington Hospital Center *	Washington, D. C.	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Rad., Surg.
Veterans Admin. Hospital	Coral Gables, Fla.	Int. Med., Path., Phys. Med., Surg.
Halifax District Hospital	Daytona Beach, Fla.	Gen'l Pract.
Broward General Hospital	Fort Lauderdale, Fla.	Path.
University of Florida Teaching Hospital and Clinics	Gainesville, Fla.	Int. Med., Psych.
Baptist Memorial Hospital *	Jacksonville, Fla.	Gen'l Pract., Path.
Duval Medical Center *	Jacksonville, Fla.	Int. Med., Ob.-Gyn., Path., Ped., Psych., Surg., Urol.
Hope Haven Hospital	Jacksonville, Fla.	Ortho. Surg.
Riverside Hospital	Jacksonville, Fla.	Int. Med., Surg.
St. Luke's Hospital *	Jacksonville, Fla.	Gen'l Pract., Int. Med., Ob.-Gyn., Surg.
St. Vincent's Hospital *	Jacksonville, Fla.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Surg., Urol.
State of Florida	Jacksonville, Fla.	Pub. Health
Southeast Florida Tuberculosis Hospital	Lantana, Fla.	Pul. Dis.
Jackson Memorial Hospital *	Miami, Fla.	Anes., Card. Dis., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Pul. Dis., Rad. Surg., Urol.
Variety Children's Hospital	Miami, Fla.	Ortho. Surg., Ped.
Mount Sinai Hospital of Greater Miami *	Miami Beach, Fla.	Int. Med., Ob.-Gyn., Path., Surg.
St. Francis Hospital *	Miami Beach, Fla.	Int. Med., Ob.-Gyn., Surg.
Orange Memorial Hospital *	Orlando, Fla.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg., Urol.
Baptist Hospital	Pensacola, Fla.	Gen'l Pract., Path.
Sacred Heart Hospital *	Pensacola, Fla.	Gen'l Pract.
U. S. Navy School of Aviation Medicine	Pensacola, Fla.	Aviat. Med.
American Legion Hospital for Crippled Children	St. Petersburg, Fla.	Ortho. Surg.
Mound Park Hospital *	St. Petersburg, Fla.	Gen'l Pract., Ob.-Gyn., Surg.
Southwest Florida Tuberculosis Hospital	Tampa, Fla.	Pul. Dis.
Tampa General Hospital *	Tampa, Fla.	Int. Med., Ob.-Gyn., Ortho. Surg., Otol., Surg.
Crawford W. Long Memorial Hospital *	Atlanta, Ga.	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Georgia Baptist Hospital *	Atlanta, Ga.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg.
Grady Memorial Hospital *	Atlanta, Ga.	Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Henrietta Egleston Hospital for Children	Atlanta, Ga.	Ped.
Piedmont Hospital *	Atlanta, Ga.	Int. Med., Ob.-Gyn., Rad., Surg.
St. Joseph's Infirmary *	Atlanta, Ga.	Card. Dis., Int. Med., Ob.-Gyn., Path., Ped., Surg., Urol.
State of Georgia	Atlanta, Ga.	Pub. Health
Veterans Admin. Hospital *	Atlanta, Ga.	Int. Med., Ophth., Path., Rad., Surg., Urol.
Eugene Talmadge Memorial Hospital *	Augusta, Ga	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Thor. Surg., Urol.

* Indicates hospitals approved for training interns.

APPROVED RESIDENCY TRAINING PROGRAMS

Name	Location	Approved Residencies
University Hospital *	Augusta, Ga.	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Augusta, Ga.	Int. Med., Neuro. Surg., Psych., Rad., Surg.
The Medical Center *	Columbus, Ga.	Gen'l Pract.
Scottish Rite Hospital for Crippled Children	Decatur, Ga.	Ortho. Surg.
Emory University Hospital *	Emory University, Ga.	Anes., Card. Dis., Int. Med., Neuro. Surg., Ortho. Surg., Path., Phys. Med., Rad., Surg., Thor. Surg.
U. S. Army Hospital *	Fort Benning, Ga.	Surg.
John L. Hutcheson Memorial Tri-County Hospital	Fort Oglethorpe, Ga.	Gen'l Pract.
Macon Hospital *	Macon, Ga.	Gen'l Pract., Ob.-Gyn., Surg.
Memorial Hospital of Chatham County *	Savannah, Ga.	Anes., Int. Med., Ob.-Gyn., Path., Surg., Urol.
Georgia Warm Springs Foundation	Warm Springs, Ga.	Phys. Med.
Kapiolani Maternity and Gynecological Hospital	Honolulu, Hawaii	Ob.-Gyn.
Kauikeolani Children's Hospital	Honolulu, Hawaii	Ped.
Leahi Hospital	Honolulu, Hawaii	Pul. Dis., Thor. Surg.
Queen's Hospital *	Honolulu, Hawaii	Int. Med., Ob.-Gyn., Path., Psych., Surg.
St. Francis Hospital *	Honolulu, Hawaii	Int. Med., Ob.-Gyn., Path.
Shriners Hospitals for Crippled Children	Honolulu, Hawaii	Ortho. Surg.
Tripler Army Hospital *	Honolulu, Hawaii	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Territorial Hospital	Kaneohe, Hawaii	Psych.
MacNeal Memorial Hospital *	Berwyn, Ill.	Gen'l Pract., Surg.
Alexian Brothers Hospital	Chicago	Path., Surg.
American Hospital *	Chicago	Path., Surg.
Augustana Hospital *	Chicago	Int. Med., Obst., Path., Rad., Surg.
Chicago Eye, Ear, Nose and Throat College and Hospital	Chicago	Ophth.
Chicago Maternity Center	Chicago	Obst.
Chicago State Hospital	Chicago	Psych.
Chicago State Tuberculosis Sanitarium	Chicago	Pul. Dis., Thor. Surg.
Chicago Wesley Memorial Hospital *	Chicago	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Psych., Rad., Surg., Urol.

* Indicates hospitals approved for training interns.

GOVERNMENT SERVICES

VETERANS ADMINISTRATION

New Atomic Reactor.—An atomic reactor, believed to be the largest ever installed in a hospital and one of the first designed specifically for medical purposes, was placed in operation at the Veterans Administration hospital in Omaha. It is housed in a vertical concrete tube 22 ft. deep and 6.5 ft. in diameter, sunk into the ground beneath the hospital. Nestled in this, it floats in 4,750 gallons of triple-distilled water which acts as a shield against escape of radioactivity. A built-in safety device eliminates any danger of an atomic explosion. The fuel rods are of a material that stops the nuclear reaction when excessive heat is generated.

It is expected that the generator will simplify performance of many tests on the blood, liver, muscle, and other tissues formerly performed by tedious and time-consuming chemical methods. The specimen to be analyzed is placed in the reactor, where it becomes radioactive. The radiation from it then is detected by a 100-channel energy-level analyzer, which produces a graph indicating the chemical makeup. It has been found, for example, that the blood level of zinc decreases markedly immediately after a heart attack. The electrocardiogram does not always differentiate at an early stage between heart attack and some other condition, such as a gastrointestinal upset, but the reactor should accomplish this. By producing radioisotopes, it will enable the Veterans Administration to increase its use of these substances for treatment and research.

Veterans Administration hospitals will still use radioisotopes supplied by the Atomic Energy Commission, but there are a number of radioisotopes that have effective lives too short to allow time for shipment from the usual sources. Some of these, such as chlorine-38, bromine-82, sodium-24, potassium-42, and copper-64, will be widely used in diagnosis and therapy. In addition to its safety design, the new reactor has these advantages: 1. It will operate at temperatures low enough so that live mice may be placed in it. This would be impossible in most other reactors. 2. It will use uranium at a rate so slow that the core material will last almost indefinitely. 3. It is so designed that samples can be run in and out quickly.

PUBLIC HEALTH SERVICE

Training in Epidemiology.—A multidisciplinary course in principles of epidemiology will be offered at the Communicable Disease Center, Public Health Service, Atlanta, Ga., Jan. 11-15, 1960, as a part of the continuing program of the Center's training branch. Designed to provide public health workers with a basic understanding of how epidemiologic techniques can be used in an approach to the solution of problems in the preventable disease field, the course is offered for the following categories of public health personnel: physicians, dentists, veterinarians, nurses, laboratory workers, environmental health personnel, and other members of the public health term. Participants will be selected on the basis of professional education and experience and current responsibility in public health programs at all levels of government. Preference will be given to persons whose professional tasks involve the application of epidemiologic procedures, and registrants will be expected to attend all sessions of the course. Further information and application forms may be obtained from the chief of the Communicable Disease Center, Public Health Service, 50 Seventh St., N. E., Atlanta 23, Ga., to the attention of the chief of the training branch.

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MEDICAL NEWS

CALIFORNA

Hospital Conference on Hallucinogenic Drug.—The first invitational conference of Napa State Hospital, Imola, a symposium on lysergic acid diethylamide (LSD-25), will be presented for staff and guests on Saturday, Jan. 16, sponsored jointly by the hospital and Sandoz Pharmaceuticals. Basic science aspects of this hallucinogenic drug will be discussed during the morning, and the afternoon session will encompass the clinical and therapeutic status of the drug. Dr. Sidney V. Cohen, chairman, research committee, Veterans Administration Center, Neuropsychiatric Hospital, Los Angeles, will be the guest lecturer. Other participants will include faculty members from Stanford and the University of California Medical School, Langley Porter Neuropsychiatric Institute, and practicing psychiatrists and psychologists.

CONNECTICUT

British Epidemiologist Named Public Health Chairman.—Dr. Anthony Monck-Mason Payne, of Great Britain, who is now chief medical officer for endemo-epidemic diseases of the World Health Organization in Geneva, will become Anna M. R. Lauder Professor of Public Health and chairman of a reorganized department of epidemiology and public health at Yale University, New Haven, July 1. He succeeds Prof. Ira V. Hiscock, who is retiring after serving on the Yale faculty since 1920. The new appointment marks a major reorganization within the Yale School of Medicine whereby the public health department and the section of epidemiology and preventive medicine will be combined under Dr. Payne with the collaboration of Dr. John R. Paul. The program of graduate training for students entering a variety of public health activities and leading to the master of public health degree will be continued, but opportunity for advanced study in epidemiology in its broadest sense will be emphasized.

FLORIDA

Annual Cardiovascular Seminar.—The second annual Hillsborough County and Suncoast Cardiovascular Seminar will be held Saturday and Sunday, Feb. 20-21, at the Hillsboro Hotel, Tampa. Programs will be presented from 9 a. m. until 4 p. m. each day. This seminar is jointly sponsored by the Hillsborough County Heart Association, Tampa, and the Suncoat Heart Association, St. Petersburg. Six specialists in diagnosis, treatment, and surgery in the cardiovascular field will present lectures and take part in panel discussions, which will be held at lunch both days and at the close of each day's program. Participants include Dr. Samuel A. Levine, Boston; Dr. Samuel Kaplan, Cincinnati; Dr. Robert Bruce Logue, Atlanta, Ga.; Dr. Richard G. Lester, Minneapolis; Dr. C. Walton Lillehei, Minneapolis; and Dr. Lawrence E. Lamb, School of Aviation Medicine, Brook Air Base, Texas. All physicians are invited. No registration fee will be charged.

ILLINOIS

Fellowship in Allergy.—Northwestern University Medical School offers a fellowship in allergy beginning about July 1, 1960 (or earlier). The following types of candidates will be considered: those who have had two years of residency in internal medicine or pediatrics; those who have completed their formal training requirements for these certifying boards; those who have completed their formal allergy training or experience and desire a period with special emphasis on investigative problems. The annual stipend is $3,600-$5,000, depending on family status and educational background. Address inquiries to Dr. Samuel M. Feinberg, Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11.

Chicago

Meeting of Ileoptimists.—Dr. Joseph B. Kirsner, professor of medicine, University of Chicago, will speak to the Ileoptimists Inc., of Chicago on Monday, Dec. 28, at 222 W. Adams St. at 7:30 p. m. His talk, "The Nature of Ulcerative Colitis," will be accompanied by colored slides. The purpose of the Ileoptimists is to help individuals in the proper care of and adjustment to ileostomies. For information, contact the president, Mr. Matt Martel at 27 S. Elm, Northlake, Ill. Mr. Martel's telephone number is FIllmore 3-9041.

Report Following Hospital Merger.—The Presbyterian-St. Luke's Hospital released a report on its record of accomplishments following the merger of the two hospitals. Last year the hospital provided 269,800 days of hospital care for 25,300 in-patients. Out-patients made 90,000 clinic visits. The hospital, which recently completed its main building has its

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

medical science research building under construction to supply new and expanded laboratory and surgical services. Presbyterian–St. Luke's is a voluntary nonprofit hospital and an affiliated teaching unit of the College of Medicine of the University of Illinois. A private hospital, it is dependent for its support on the people of Chicago and the midwest.

Dr. Katz Gives Annual Lecture.—Dr. Louis N. Katz was presented the third honorary lectureship award of Albany Medical College of Union University Nov. 19. Prior to the award, Dr. Katz gave a lecture, "Energy of the Beating Heart." The award ceremonies were initiated by Harold C. Wiggers, Ph.D., dean of Albany Medical College, and son of Dr. Carl J. Wiggers, under whom Dr. Katz studied at Western Reserve University School of Medicine, Cleveland. Since 1930, Dr. Katz has been director of the cardiovascular research department at the Medical Research Institute of the Michael Reese Hospital in Chicago. The honorary lectureship, which recognizes "distinguished service to mankind in the fields of science, medicine and teaching," is Albany Medical College's highest honor.

Lectures on Growth of Medicine.—Northwestern University Medical School announced the sixth annual series of lectures on "The Growth of Medicine." The one-hour talks will be given every Tuesday at 8 a. m. in room 641 of the Medical School, 303 E. Chicago Ave., Chicago. The series has been planned under the chairmanship of Dr. Frederick W. Stenn, assistant professor of medicine. Members of the medical profession and the public are invited. The lectures and lecturers are as follows:

Jan. 5.—The Evolution of Quackery, Dr. Morris Fishbein, professor emeritus of medicine, University of Illinois College of Medicine.
Jan. 12.—The History of Faith Healing, Rev. Richard Dahl, chaplain, Chicago Wesley Memorial Hospital.
Jan. 19.—Dawn of Histology, Leslie B. Arey, Ph.D., professor of anatomy emeritus, Northwestern University Medical School.
Jan. 26.—Emergence of Modern Medicine from Ancient Folkways, Dr. Walter C. Alvarez, professor of medicine, emeritus, University of Minnesota Mayo Foundation.
Feb. 2.—They Were Also Patients: George Gershwin, Clarence Darrow and Adolph Hiter, Dr. Noah D. Fabricant, associate editor, *Ear, Eye, Nose & Throat Monthly.*
Feb. 9.—The Medical Revolution, Dr. Lester S. King, clinical professor of pathology, University of Illinois College of Medicine.
Feb. 16.—The History of Vascular Surgery, Dr. William S. Dye Jr., clinical associate professor of surgery, University of Illinois College of Medicine.
Feb. 23.—Medical Illustrations, Mr. Thomas Jones, professor of medical and dental illustrations emeritus, University of Illinois College of Medicine.
March 1.—The Chamberlens and the Obstetric Forceps, Dr. William B. Serbin, assistant professor of obstetrics and gynecology, Northwestern University Medical School.
March 8.—Chest Pain, Its Appreciation Through the Ages, Dr. William H. Wehrmacher, instructor in medicine, Northwestern University Medical School.

KANSAS

Dr. Carter Named Pathology Chairman.—Dr. John R. Carter, from the University of Iowa, Iowa City, was appointed professor of pathology and chairman of the department at the University of Kansas School of Medicine, Kansas City. Dr. Carter, whose appointment is effective Jan. 1, fills the post held for over 10 years by Dr. Robert E. Stowell, who is now scientific director of the Armed Forces Institute of Pathology in Washington, D. C. Dr. Carter has held academic appointments at the University of Iowa, from instructor to professor, since 1944. From 1946 to 1948 he served as assistant and chief pathologist at the Naval Medical School in Bethesda, Md. In April, he was elected to the council of the International Academy of Pathology.

MARYLAND

Veterinarian Receives Animal Care Award.—The Charles A. Giffin Award for 1959 was presented at the 10th annual meeting of the Animal Care Panel to Robert D. Henthorne, D.V.M., chief of the Animal Laboratory Division of Microbiological Associates, Inc., of Bethesda, "in recognition of his work in promoting and developing high standards for the production and use of disease-free animals." The Giffin Award, established in 1956 to honor the late Charles A. Giffin, Veterinary Bacteriologist at the New York State Department of Health Laboratories in Albany, is presented annually "to the person who most significantly advances the concepts of improved laboratory animal quality."

MICHIGAN

Program for Medical Care Research.—A new training program titled "Research in Medical Care" is being offered to graduate students by the University of Michigan's School of Public Health. The program, supported by a five-year grant from the Ford Foundation, is designed chiefly to train graduates in the effect of social factors on the health care of the aged. A limited number of paid research assistantships are available to students with a background in public health, social work, economics, sociology, and certain other social sciences. To be eligible, the student must be accepted into a graduate program at the U-M in one of these fields. Training includes an introduction to medical care, study of the social factors in health organization, and the preparation and carrying out of research projects. Dr. Solomon J. Axelrod, director of the U-M Bureau of Public Health Economics, is in charge of the program. The first applications will be due Feb. 1 from students wishing to enter the program next fall.

NEW YORK

Hospital Program for Visiting Professors.—Beginning next July 1 with the start of the new academic year, Highland Hospital, Rochester, will institute a new program of visiting professorships designed to

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intensify graduate training for medical interns and residents and to provide educational "refresher" facilities for the 300 doctors who are on the attending staff. The program, announced by Dr. Jacob W. Holler, chief of medicine and director of graduate education, calls for the teaching services of at least six "outstanding" medical professors drawn from the faculties of medical institutions in the United States and Canada, who will be medical specialists in medicine, surgery, obstetrics and gynecology, pediatrics, and various subspecialties.

Society News.—The officers of the New York Allergy Society are as follows: president, Dr. S. Senior Sack, Flushing; president-elect, Dr. Joseph H. Fries, Brooklyn; vice-president, Dr. Sheppard Siegal, New York City; secretary, Dr. Ely Perlman, New York City; treasurer, Dr. Murray Dworetzky, New York City, and assistant secretary-treasurer, Dr. Walter R. Kessler, New York City.—On May 11, the New York Academy of Gastroenterology elected officers for 1959-1960: Dr. Michael Weingarten, president; Dr. Joseph R. Van Dyne, president-elect; Dr. Hyman M. Robinson, first vice-president; Dr. Henry Colcher, second vice-president; Dr. Edward J. Nightingale, secretary; Dr. Jerome Weiss, recording secretary; and Dr. William C. Jacobson, treasurer.

New President of Physicians' Home Fund.—Dr. David J. Kaliski, of New York City, was elected president of the Physicians' Home, succeeding Dr. Charles Gordon Heyd, also of New York City, on the 40th anniversary of the home. Dr. Kaliski also becomes the presiding officer of the board of directors and chairman of the home's executive committee. The Physicians' Home is a fund for the maintenance of elderly indigent physicians and surgeons who have been members of the State Medical Society, and doctors' widows and orphans who are eligible. The home maintains offices at the society's headquarters at 750 Third Ave., New York 17. The fund enables beneficiaries to reside wherever they wish, and payments are usually on a permanent basis.

New York City

Library Dedicated.—The Eugene F. Dubois Library was dedicated Nov. 24 by the staff of the Second (Cornell) Medical Division, Bellevue Hospital. Honoring the late physician and physiologist, it occupies the exact site of his pioneer research in human metabolism, begun at Bellevue in 1911.

Foreign Lecturer.—Dr. Francis E. Camps, forensic pathologist of the coroner's office and lecturer in forensic medicine in the London Hospital Medical College, London, England, delivered a lecture entitled "Burden of Proof" at the New York University–Bellevue Medical Center, Nov. 30.

NORTH CAROLINA

Dr. Wells Named Library Regent.—President Dwight D. Eisenhower appointed Dr. Warner L. Wells, associate professor, department of surgery, University of North Carolina School of Medicine, Chapel Hill, as regent of the National Library of Medicine. The library began during the last century as the Army Medical Library. It later became known as the Library of the Surgeon General's Office and later the Armed Forces Medical Library. Last year the name was changed to the National Library of Medicine. It is now a unit of the United States Public Health Service.

Medical Foundation Elects Layman President.—Mr. Paul W. Schenck Jr., Greenboro businessman, was elected president of the Medical Foundation of North Carolina. Mr. Schenck succeeds Dr. Paul F. Whitaker, Kinston, who has held the post since 1956. The purpose of the foundation is to aid and promote medical education, services, and research by giving financial assistance to the University of North Carolina School of Medicine, the UNC School of Nursing, and North Carolina Memorial Hospital. The Medical Foundation of North Carolina was founded in 1949, with Major L. P. McLendon, of Greensboro, as president. It serves as a depository for private funds which are used to forward a good-health program for the entire state.

PENNSYLVANIA

Plan Center for Disturbed Children.—The Eastern Pennsylvania State School and Hospital designed for a rural site in Bensalem Township, Bucks County, will be Pennsylvania's first state institution expressly for the care and treatment of emotionally disturbed children. It will be operated by the Department of Public Welfare and will offer both residential and out-patient care for children with psychiatric disorders referred by custodial and social agencies. The program for the institution calls for a self-contained community, with residential "neighborhoods," a school, recreation-community center, and hospital. Construction will be in two phases. The first phase, valued at about 8 million dollars will have a capacity of 340 patients, and will include a 164-bed clinic building; separate units for food service, recreation, and education, and 12 cottages housing a total of 176 patients. Later, cottages will be built for 148 patients, classroom and recreation space will be expanded, and a 20-bed research unit will be added. New structures for administration, worship, and maintenance are also included in this later phase. Construction is expected to begin in the spring of 1960.

Philadelphia

Building for Laboratory Animals.—Mr. William Goldman, Philadelphia philanthropist, officiated at the opening of a large, newly reconstructed animal colony for medical research donated by him to

Hahnemann Medical College. The three-story building facing Vine Street within the Hahnemann "block" will house laboratory animals in use in Hahnemann's research program. The $1,000,000 research program at 112-year-old Hahnemann covers more than 97 projects centered mainly in heart disease and cancer. The gift by Mr. Goldman to Hahnemann College is the latest of a number of sizable benefactions to the institution by the philanthropist, including the William Goldman Radio-Isotope Laboratory.

Annual Lecture.—The annual Phi Delta Epsilon Lectureship under the auspices of the Sigma Chapter at the Temple University School of Medicine, will be held Feb. 17. The lecturer will be Dr. Seymour S. Kety, chief, National Institute of Mental Health, Bethesda, Md., who will speak on the biologic aspects of schizophrenia.

Personal.—Dr. Harry E. Bacon who served as honorary professor at the University of Guayaquil was awarded the "Oficer de Order Al Merito" by the Republic of Ecuador, recently.——Marion Fay, Ph.D., president and dean of Woman's Medical College of Pennsylvania, was elected an honorary fellow in the College of Physicians of Philadelphia on Oct. 7.

Hospital Receives Research Grant.—The eighth grant made since 1954 to Pennsylvania Hospital by the John A. Hartford Foundation, Inc., of New York City, was announced Dec. 6. The latest award of $351,120, which brings to $1,320,000 the amount given by the foundation to the hospital for scientific research and special programs, will be used over a three-year period to study diseases of the gastrointestinal tract and the relationship of endocrine glands and stress on peptic ulcer formation. The Hartford Foundation was originally established by John A. Hartford to distribute his personal charitable donations. His brother George L. Hartford, who died in 1957, left his entire estate to the foundation. John A. Hartford was president of the Great Atlantic & Pacific Tea Company and George L. Hartford was chairman of the board.

TEXAS

New Dallas Hospital Dedicated.—Dedication ceremonies of the $4,500,000 Women and Children's Hospital, newest addition to the facilities of the Baylor University Medical Center in Dallas, were held Oct. 22. The first new patients were admitted to the hospital on Oct. 28. All maternity patients and children in Baylor's Pediatric Division in the former Maternity Division of Baylor were moved into the new Women and Children's Hospital. The new hospital contains 196,000 square feet and two wings of seven stories each, plus a full basement and two-story machinery penthouse. A bedside service panel developed at Baylor will permit the patient to control television, select from five radio channels, piped in music, or chapel services. The medical center now is composed of three hospitals: George W. Truett Medical and Surgical Hospital, Women and Children's Hospital, and the Minnie S. Veal Teaching and Research Hospital. Originally the hospital was named the Texas Baptist Memorial Sanitarium. In 1920, the name became the Baylor Hospital; in 1936, the name was changed to the Baylor University Hospital.

GENERAL

Obstetricians and Gynecologists Change Office.—The American College of Obstetricians and Gynecologists announced that as of Sept. 20 its administrative office is located at 79 W. Monroe St., Room 1120, Chicago 3. The telephone number will remain FRanklin 2-3124.

Bacteriologists to Meet in Philadelphia.—The 60th annual meeting of the Society of American Bacteriologists, will be held in Philadelphia. The meeting, to be held May 1-5, will feature more than 450 papers dealing with "latest research findings in bacteriology and microbiology," said Harry E. Morton, Ph.D., meeting chairman. Dr. Morton, professor of bacteriology at the School of Medicine of the University of Pennsylvania, said that a minimum of seven sessions would be held simultaneously in three mid-Philadelphia hotels.

Bahamas Allergy Conference.—The first Bahamas Allergy Conference will take place at the Nassau Beach Lodge, Nassau, Bahamas, March 5-12, 1960. About 40 speakers will talk on various phases of allergy and there will be time for discussion. The meeting will follow the 16th annual congress of the American College of Allergists, which will be held at the Americana Hotel, Bal Harbour, Miami Beach, Fla., Feb. 28-March 4. For information, write Dr. Leon Unger, 185 N. Wabash Ave., Chicago 1.

Mr. E. R. Loveland Retires.—Mr. Edward R. Loveland, F. A. C. P. (Hon.) will retire Dec. 31 as executive secretary of the American College of Physicians after completing nearly 34 years of service to the college. He became the executive secretary on April 4, 1926, and without delay undertook the establishment of the college headquarters in Philadelphia and the development of an efficient administrative program. Mr. Loveland will be succeeded by Dr. Edward C. Rosenow Jr., executive director of the Los Angeles County Medical Association, who will take office on Jan. 1. Dr. Rosenow received his M.D. degree from Harvard Medical School, Boston, and M.S. (Med.) degree from the University of Minnesota, Mayo Foundation, Rochester, Minn.

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Heart Chairmen Named.—Mrs. Dwight D. Eisenhower and Dr. Paul Dudley White will serve as honorary chairman and co-chairman, respectively, of the 1960 national Heart Fund drive. This will mark their third successive year as campaign aides in these capacities. The 1960 Heart Fund drive, to be conducted throughout the nation by the American Heart Association and its affiliates during the month of February, is based on the slogan "Heart Disease—Number One Enemy, Heart Fund—Number One Defense."

Report on Traffic Fatalities.—The nation's traffic death toll came down in October for the first time in 1959, the National Safety Council reported Dec. 4. The October toll, 3,420 highway fatalities, not only was 5% below the same month last year (3,600) but was the lowest for any October since 1949. The death toll for the first 10 months of this year was 2% above the same period last year—as contrasted with a 5% increase at the end of the first seven months and with monthly increases earlier in the year that ranged up to 8%. The 10-month toll was 30,560, as compared with 29,870 for the same period in 1958. Disabling injuries from traffic accidents in the 10-month period were estimated at 1.1 million.

Psychosomatic Meeting in Montreal.—The American Psychosomatic Society's 17th annual meeting will be held at the Sheraton-Mt. Royal Hotel, Montreal, on Saturday and Sunday, March 26 and 27. The program will consist of four sessions, three of which will be general. A half-day special session, on Sunday morning, will be allotted to the panel presentation, "Contributions of Behavioral Scientists to Psychosomatic Medicine." Panel speakers will represent fields of anthropology, medicine, psychiatry, and sociology. The registration fee for nonmembers is $5. Students, interns, residents, and fellows will be admitted to the sessions upon payment of $1. The society will hold its annual cooperative cocktail party following the Saturday afternoon session. For information, write the American Psychosomatic Society, 265 Nassau Road, Roosevelt, N. Y.

Proctology Award Contest.—The International Academy of Proctology announced its annual cash prize and certificate of merit award contest for 1959-1960. The best unpublished contribution on proctology or allied subjects will be awarded $100 and a certificate of merit. The winning contribution will be selected by a board of judges, and all decisions are final. The formal award of the first prize, and presentation of other certificates, will be made at the annual convention dinner dance of the International Academy of Proctology, April 27, 1960, at the Americana Hotel, Miami Beach, Fla. The academy reserves the exclusive right to publish all contributions in its official publication, *The American Journal of Proctology*. All entries are limited to 5,000 words, must be typewritten in English, and submitted in five copies. Entries must be received no later than Feb. 1. Entries should be addressed to Dr. Alfred J. Cantor, Executive Officer, International Academy of Proctology, 147-41 Sanford Ave., Flushing 55, N. Y.

Meeting of Orthopedists.—The 27th annual meeting of the American Academy of Orthopaedic Surgeons, Inc., will be held Jan. 23-28 at the Palmer House, Chicago. The presidential address will be given by Dr. Harold A. Sofield, Oak Park, Ill., the morning of Jan. 25. Papers to be presented by special invitation include "The Fracture of the Carpal Scaphoid," by Prof. Otto Russe, Vienna, Austria, and "Paralytic Scoliosis," by Prof. J. I. P. James, Edinburg, Scotland. An audio-visual program will be conducted each day and will include the following presentations by foreign producers:

Recurrent Dislocation of the Shoulder, Dr. Herbert F. Moseley, Montreal, Quebec, Canada.
Arthroplasty of Elbow and Knee, Prof. Oscar Scaglietti, Florence, Italy.

Instructional courses and scientific exhibits are planned. The annual banquet will be held the evening of Jan. 27. The 28th annual meeting will be held at the Americana Hotel, Bal Harbour, Fla., Jan. 8-13, 1961.

Cancer Conference in Minneapolis.—The fourth International Cancer Conference sponsored by the American Cancer Society and the International Cancer Institute will be held in Minneapolis Sept. 13-15 under the theme, "Changing Concepts Concerning Cancer." Dr. Michael B. Shimkin, Bethesda, Md., will open the meeting with an address on the theme. Panel discussions are planned on cancer etiology, cancer pathogenesis, and cancer therapy. Symposiums are listed as follows:

Cancer of the Breast
Cancer of the Lung
Cancer of the Female Genital Tract
Cancer of the Gastrointestinal Tract
Cancer of the Male Genitourinary Tract
Leukemias and Lymphomas
Cancer of the Skin
Cancer of the Head and Neck
Cancer Control

For information, write the American Cancer Society, Inc., Medical Affairs Department, 521 West 57th St., New York 19.

Brazilian Physician Awarded Rehabilitation Fellowship.—The awarding of a Pfizer Fellowship in Rehabilitation to Dr. Haroldo Campos Guimaraes, or Sao Paulo, Brazil, was announced Nov. 27, in Rio de Janeiro, Brazil, by the Ambassador of the United States to Brazil, Hon. John M. Cabot. The Pfizer Fellowship in Rehabilitation has been created by

the World Rehabilitation Fund through funds made available by Chas. Pfizer & Co., Inc. Dr. Howard A. Rusk, New York City, president, World Rehabilitation Fund, participated in the reception at the American Embassy at which Ambassador Cabot made the announcement. Dr. Guimaraes is currently a member of the staff of the Instituto Nacional de Rehabilitacao–Clinica Ortopedica de Traumatologica of the Medical Faculty of the University of Sao Paulo. Dr. Rusk explained that the Pfizer Fellowship was being given by the World Rehabilitation Fund in cooperation with the International Society for the Welfare of Cripples and its affiliate in Brazil, the Associacao de Assistencia a Crianca Defeituosa. He said Dr. Guimaraes' postgraduate training would begin Jan. 1 at the Institute of Physical Medicine and Rehabilitation, New York University–Bellevue Medical Center.

Triological Meeting in Philadelphia.—The American Laryngological, Rhinological, and Otological Society, Inc., the Triological Society, will hold an eastern sectional meeting Jan. 8 at the Warwick Hotel, Philadelphia. Dr. Theodore E. Walsh, St. Louis, president of the society, will open the meeting. The program includes the following papers:

Carcinoma of the Tonsil, Drs. John F. Daly, Milton Friedman, New York City.

The Clinical Characteristics of Vertiginous Epilepsy, Dr. Bernard J. Alpers, Philadelphia.

Problems and Complications in Head and Neck Surgery, Dr. George A. Sisson, Syracuse, N. Y.

Cancer of the Ear (A Review of 150 Surgically Treated Cases), Dr. John S. Lewis, New York City.

Viral Infections of the Respiratory Tract, Dr. Walter Havens Jr., Philadelphia.

Malignancy of the Salivary Glands: A Follow-up Survey, Dr. Frank D. Lathrop, Boston.

Experiences with the Fenestra Ovalis Technique of Shea, Dr. David Myers, S. D. Erukar, Ph.D., Dr. Woodrow D. Schlosser, Dr. Lindsay Pratt, and Richard A. Winchester, Ph.D., Philadelphia.

For information, write Dr. Floyd J. Putney, Vice-President, Triological Society, 712 Locust St., Philadelphia 3.

Society News.—The **American Association for the Surgery of Trauma** officers for 1959-1960 are: president, Dr. James K. Stack, Chicago; president-elect, Dr. Harrison L. McLauchlin, New York City; vice-president, Dr. Preston A. Wade, New York; secretary, Dr. William T. Fitts Jr., Philadelphia; treasurer, Dr. Raymond Householder, Chicago; and recorder, Mr. Fraser N. Gurd, Montreal, Que. The next annual meeting will be held at the Hotel del Coronado, Coronado, Calif., Oct. 5-7.—The elected officers of the **Central Association of Obstetricians and Gynecologists** are: president, Dr. Isadore Dyer, New Orleans; president-elect, Dr. Edwin J. DeCosta, Chicago; vice-president, Dr. Joseph G. Webster, Kansas City, Mo.; secretary-treasurer, Dr. Herman L. Gardner, Houston, Texas; and assistant secretary, Dr. Roy G. Holly, Omaha.—The 1960 officers of the **Mississippi Valley Medical Society** are as follows: president-elect, Dr. Preston C. Hall, St. Louis; vice-president for Illinois, Dr. Lee N. Hamm, Lincoln; vice-president for Iowa, Dr. Paul J. Leehey, Independence; vice-president for Kansas, Dr. Clarence H. Benage, Pittsburg; vice-president for Minnesota, Dr. Bernard C. Glueck Jr., Minneapolis; vice-president for Missouri, Dr. Jack M. Martt, Columbia; vice-president for Nebraska, Dr. Clyde L. Kleager, Hastings; vice-president for North Dakota, Dr. Reuben H. Waldschmidt, Bismarck; vice-president for South Dakota, Dr. Alonzo P. Peeke, Volga; vice-president for Wisconsin, Dr. Wallace Marshall, Watertown; and accounting officer, Dr. Harold Swanberg, Quincy, Ill.

LATIN AMERICA

Ophthalmologists Transfer Meeting Site.—The sixth Pan American Congress of Ophthalmology, scheduled to meet in Caracas, Venezuela, Jan. 31 to Feb. 6, has been transferred to the Club Puerto Azul, on the ocean about an hour's drive from Caracas, Dr. Brittain F. Payne, New York City, president of the Pan American Association of Ophthalmology, announced Dec. 4. Physicians may make reservations through Mr. Thomas D. Callahan, Manager, World Wide Travel Department, AAA, LaSalle at 13th Street, Minneapolis 3, Minn.

Radiology Congress in Mexico.—The first National Congress of Radiology and third Mexican Radiologic Technical Exhibit will be held on Feb. 7-13 in the University City of Mexico City. Dr. Jose Alvarez Amezquita, the Ministry of Public Health and Social Assistance, will be the honorary president. The program includes lectures, symposiums, and presentation of films, and round-table discussions. On Feb. 11, a session of the executive committee will be held at 5 p. m. For information, write Sociedad Mexicana de Radiologia, Calle de Coahuila 35, Mexico 7, D. F., Mexico.

FOREIGN

Change Dates for Film Prize.—The annual Prize of the Medico-Surgical Cinema of "Presse Médicale" will be awarded March 22, 1960, at the new Faculty of Medicine instead of April 5 as it had been previously published. Candidatures and films must be directed to the Secretary's office of the Journal, la Presse Médicale, 120, Boulevard Saint-Germain, Paris VI, before Feb. 15.

Teaching Film Program.—The German Medical Association, host of the 14th general assembly of the World Medical Association, scheduled to convene in West Berlin, Sept. 15-21, is planning to have an extensive medical film program. All medical associations are cordially invited to present to the German Medical Association their recommendations as to outstanding postgraduate medical teaching films particularly those produced in their country, which should be given consideration by the

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special committee appointed to select the films to be shown. The World Medical Association Headquarters Secretariat, 10 Columbus Circle, New York 19, is issuing a special "Film Recommendation Sheet" for the use of the member associations.

CORRECTION

Therapy for Lipid Pneumonia.—In THE JOURNAL, Nov. 28, page 1810, in the article by Dr. Joshua Seidel, entitled "Mucolytic Aerosol Therapy for Lipid Pneumonia," an error appears. Line 10 of the second column on page 1812, which reads, "although the lesions had cleared by x-ray therapy," should read, "although roentgenographic studies showed clearing of the lesions."

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates: Stations around the world. March 16, 1960 and Sept. 21, 1960. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part I, Various Cities, June 21-22 and Sept. 7-8. Part II, Various Cities, April 19-20. Applications must be received at least six weeks before the date of the examination. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 21-23. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery.

ALASKA:* On application in Anchorage or Fairbanks. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

CONNECTICUT:* *Regular. Examination.* Hartford, Mar. 8-10. Sec., Dr. Stanley B. Weld, 160 St. Ronan St., New Haven. *Homeopathic. Examination.* Derby, Mar. 8. Sec., Dr. Ronald A. Davis, 38 Elizabeth St., Dover.

DELAWARE: *Examination.* Dover, Jan. 12-14. *Endorsement.* Dover, Jan. 21. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

GEORGIA: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. Cecil L. Clifton, 224 State Capitol, Atlanta 3.

GUAM: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

HAWAII: *Examination.* Honolulu, Jan. 11-12. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: *Examination* and *Reciprocity.* Boise, Jan. 11, 12, 13. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

INDIANA: *Examination.* Indianapolis, June 1960. *Reciprocity.* Indianapolis, fourth Wednesday of each month. Ex. Sec., Miss Ruth V. Kirk, 538 K. of P. Bldg., Indianapolis.

KANSAS:* *Examination and Reciprocity.* Kansas City, Jan. 15-16. Sec., Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

MASSACHUSETTS: *Examination.* Boston, Jan. 12-15. Sec., Dr. David W. Wallwork, Room 37, State House, Boston.

MINNESOTA:* *Examination.* Minneapolis, Jan. 19-21. *Reciprocity.* Minneapolis, Jan. 21. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: *Examination.* Jackson, June. Sec., Dr. A. L. Gray, Old Capitol, Jackson 13.

MONTANA: *Examination and Reciprocity.* Helena, April 5. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEBRASKA:* *Examination.* Omaha, June 13-15, 1960. Dir., Bureau of Examining Boards, Room 1009, State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: *Examination.* Concord, March 9-11. *Reciprocity.* Concord, March 9. Sec., Dr. Edward W. Colby, 61 South State St., Concord.

NEW JERSEY: *Examination.* Jan. 19-22. *Reciprocity.* Monthly, Admin. Sec., Michael E. H. Sweeney, 28 West State St., Trenton.

NORTH CAROLINA: *Reciprocity.* Southern Pines, Jan. 8. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, Jan. 6-8. *Reciprocity.* Grand Forks, Jan. 9. Sec., Dr. C. J. Glaspel, Box 228, Grafton.

OKLAHOMA:* *Examination.* Oklahoma City, May 31-June 1. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination.* Portland, Jan. 12-13. *Reciprocity.* Portland, Jan. 14-16. Ex. Sec., Mr. Howard J. Bobbitt, 609 Failing Bldg., Portland 4.

PENNSYLVANIA: *Examination.* Philadelphia, January. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* *Examination.* Providence, Jan. 7-8. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA:* *Examination.* Sioux Falls, Jan. 19-20. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

UTAH: *Examination.* Salt Lake City, July 6-8. Director, Mr. Frank E. Lees, 324 State Office Bldg., Salt Lake City 1.

WASHINGTON:* *Examination.* Seattle, Jan. 11-13. Administrator, Professional Division, Capitol Bldg., Olympia.

WEST VIRGINIA: *Examination.* Charleston, Jan. 11-13. Sec., Dr. Newman H. Dyer, State Office Bldg., No. 3, Charleston 5.

WISCONSIN:* *Examination.* Madison, Jan. 14-16. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Building, 1 West Wilson St., Madison.

WYOMING: *Examination and Reciprocity.* Cheyenne, Feb. 1. Sec., Dr. James W. Sampson, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, April 21-22. Sec., Dr. A. W. Ford, Department of Education, Education Bldg., Little Rock.

COLORADO: *Examination and Reciprocity.* Denver, March 2-3. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: *Examination.* New Haven, Feb. 13. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

IOWA: *Examination.* Des Moines, Jan. 12. *Reciprocity.* Des Moines, Jan. 11. Sec., Dr. Elmer W. Hertel, Waverly.

KANSAS: *Examination.* Kansas City, June 10-12. Sec., Dr. Leon C. Heckert, Kansas State College, Pittsburg.

MICHIGAN: *Examination.* Detroit and Ann Arbor, Feb. 12-13. Sec., Mrs. Anne Baker, West Michigan Ave., 116 Stevens T. Mason Bldg., Lansing.

MINNESOTA: *Examination.* Minneapolis, Jan. 5-6. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

NEW MEXICO: *Examination.* Santa Fe, Jan. 17. *Reciprocity.* Santa Fe, Jan. 9. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

OKLAHOMA: *Examination.* Oklahoma City, April 15-16. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

TEXAS: *Examination.* Austin, Houston, Galveston and possibly Dallas, April 15-16. Sec., Dr. Cornelia M. Smith, State Office Bldg., 201 East 14th St., Austin.

WASHINGTON: *Examination.* Seattle, Jan. 6-7. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

*Basic Science Certificate required.

DEATHS

Alexander, John Gordon Ⓜ Glen Burnie, Md.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1910; veteran of World War I; staff member, Maryland General Hospital in Baltimore; died Sept. 16, aged 68.

Barnes, Finis E., Charleston, Ill.; American Medical College, St. Louis, 1903; died Sept. 30, aged 86.

Beyer, Arthur Ray Ⓜ Tampa, Fla.; Louisville (Ky.) Medical College, 1907; member of the Southeastern Surgical Congress and the Aero Medical Association; fellow of the International College of Surgeons; past-president of the Seaboard Airline Railway Surgeons Association; died Sept. 27, aged 79.

Carswell, Robert Lee Ⓜ Colonel, U. S. Army, retired, New York City; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; veteran of World War I; entered the regular Army in 1902 and retired Aug. 18, 1920, for disability in line of duty; died in the U. S. Army Hospital, Fort Jay, N. Y., July 21, aged 82.

Claudy, William Duvall Ⓜ Arlington, Va.; George Washington University School of Medicine, Washington, D. C., 1938; member of the board of police and fire surgeons of the District of Columbia; certified by the National Board of Medical Examiners; served an internship at George Washington University Hospital and served a residency at the Gallinger Municipal and Doctors hospitals in Washington, D. C.; major in the medical corps, U. S. Air Force Reserve from May, 1953, to April, 1955; died Oct. 6, aged 45.

Fischer, Andrew Leroy Ⓜ Hoffman, Ill.; American Medical College, St. Louis, 1905; past-president of the Clinton County Medical Society; veteran of World War I; during World War II received honorable mention for distinguished service as a selective service medical examiner; for many years company physician and surgeon of the Southern Railway System; in 1951 the people of Hoffman presented him with a plaque "in appreciation of 45 years of faithful service to the village of Hoffman and Community"; on the staffs of St. Joseph's Hospital in Breese and St. Mary's Hospital in Centralia, where he died Sept. 28, aged 77.

Harrison, Ross Granville, New Haven, Conn.; born in Germantown, Pa., Jan. 13, 1870; received the degree of doctor of philosophy at Johns Hopkins in Baltimore in 1894 and the medical degree at Rheinische Friedrich–Wilhelms–Universitat Medizinische Fakultat, Bonn, Prussia, 1899; lecturer in morphology at Bryn Mawr (Pa.) College, 1894-1895; instructor and associate in anatomy at Johns Hopkins from 1896 to 1899 and associate professor of anatomy from 1899 to 1907; from 1907 to 1927 Bronson Professor of Comparative Anatomy at Yale University and Sterling Professor of Biology from 1927 to 1938, when he became professor emeritus; lectured throughout the world, having given the Dunham Lectures at Harvard University, the Croonian Lectures of the Royal Society in London, the Linacre Lectures at St. John's College, Cambridge, and the Silliman Lectures at Yale; chairman of the National Research Council in Washington, D. C., from 1938 to 1946; a member of the science committee of the National Resources Planning Board from 1938 to 1943; member of the board of trustees, Marine Biological Laboratory, Woods Hole, Mass., London Biological Station, Woods Hole Oceanographic Institute Science Service, and the Bermuda Biological Station, of which he was treasurer from 1930 to 1946; past-president of the sixth Pacific Scientific Congress, American Society of Zoologists, American Association of Anatomists, Anatomische Gesellschaft, and the American Society of Naturalists; fellow of the American Association for the Advancement of Science and the American Academy of Arts and Sciences; member of many national, state and local professional and scientific societies; member, honorable member, corresponding member, or foreign member of several foreign professional and scientific societies; for many years member of the board of scientific directors and trustee of the Rockefeller Institute for Medical Research; member of the board of scientific advisers, Jane Coffin Childs Fund for Medical Research; in 1956 recipient of the Antonio Feltinelli award of the Accademia Nazionale dei Lincei, Rome, Italy; in 1914 awarded the Archduke Rainer Medal of the Imperial Royal Zoological Botanical Society of Vienna; in 1925 given the John Scott Medal and premium by the city of Philadelphia "for the invention of devices for tissue grafting and for tissue culture"; in 1947 awarded the John J. Carter Medal of the National Academy of Sciences; in 1907 was the first to adapt the hanging drop culture method to the study of embryonic tissues and demonstrated directly the outgrowth of the developing nerve fiber; member of the editorial board, and from 1903 to 1946 managing editor of the *Journal of Experimental Zoology;* held honorary doctor of science degrees from the universities of Cincinnati, Chicago, Columbia, Dublin, Harvard, Michigan, and

Ⓜ Indicates Member of the American Medical Association.

Yale; also held an honorary M.D. degree from Pazmany University, Budapest, an honorary Ph.D. from the University of Freiburg, and an honorary LL.D. degree from Johns Hopkins University; died Sept. 30, aged 89.

Jamison, William Parks, Rowlesburg, W. Va.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1940; veteran of World War I; died Sept. 28, aged 59.

Kalvin, Henry Maximilian Ⓜ St. Petersburg, Fla.; University and Bellevue Hospital Medical College, New York City, 1900; formerly practiced in Brooklyn, where he was on the staff of the Shore Road Hospital; died Oct. 3, aged 81.

Kimball, Russell Cornelius, West Brentwood, N. Y.; University of Michigan Medical School, Ann Arbor, 1928; member of the staff of the Pilgrim State Hospital; died July 7, aged 58.

Lane, Andrew J., Detroit; University of Louisville (Ky.) Medical Department, 1909; veteran of the Spanish–American War; died Aug. 2, aged 86.

Lang, John Michael Ⓜ Del Mar, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; formerly assistant professor of obstetrics and gynecology at his alma mater; for many years practiced in Chicago, where he was on the staff of the West Side Hospital; died in La Jolla Oct. 6, aged 87.

McGuire, Lee Wesley Ⓜ Batavia, Ohio; Medical College of Ohio, Cincinnati, 1906; for many years served in the regular U. S. Navy, resigning with the rank of lieutenant commander; held the Navy Cross; formerly practiced in Boston; at one time associated with the Malden (Mass.) Hospital; died in the Jewish Hospital, Cincinnati, Oct. 1, aged 76.

Mittelmann, Bela Ⓜ New York City; Deutsche Universitat Medizinische Fakultat, Prague, Czechoslovakia, 1922; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychoanalytic Association, American Psychosomatic Society, American Psychiatric Association, and the Association for Research in Nervous and Mental Disease; visiting professor at the Albert Einstein College of Medicine; on the staff of the Bronx Municipal Hospital Center; coauthor of "Principles of Abnormal Psychology"; died Oct. 4, aged 60.

Powers, Vernon Blank, San Marco, Texas; Barnes Medical College, St. Louis, 1907; died in Austin Sept. 29, aged 75.

Roberts, C. A., Leary, Ga.; Louisville (Ky.) Medical College, 1892; died Sept. 22, aged 87.

Saylor, Clinton Theodore Ⓜ Rockwood, Pa.; Eclectic Medical Institute, Cincinnati, 1908; formerly member of the Rockwood school board and coroner of Somerset County; served on the staff of the Somerset (Pa.) Community Hospital; a charter member and past-president of the Rockwood Rotary Club; died in the Casualty Hospital, Washington, D. C., Sept. 21, aged 78.

Smith, Clarence Vernon Ⓜ Detroit; University of Illinois College of Medicine, Chicago, 1913; veteran of World War I; on the staffs of the Saratoga General and Holy Cross hospitals; died Sept. 18, aged 69.

Spinning, Alva L. Ⓜ Palm Springs, Calif.; Medical College of Indiana, Indianapolis, 1891; formerly practiced in Covington, Ind., where he was health commissioner of Fountain County; died in the General Hospital of Riverside County, Arlington, Sept. 30, aged 93.

Swanljung, Helvi Annikki, La Crosse, Wis.; Helsingfors Universitet Medicinska Fakulteten, Helsingfors, Finland, 1946; served on the staff of the Lutheran Hospital; died Sept. 30, aged 43.

Thomas, John Henry Ⓜ South Orange, N. J.; Columbia University College of Physicians and Surgeons, New York City, 1927; certified by the National Board of Medical Examiners; member of the American Academy of General Practice; veteran of World War II; on the staff of the Orange Memorial Hospital, where he died Oct. 3, aged 55.

Vermeer, Weyer Losecaat, Upper Nyack, N. Y.; Rijks–Universiteit te Leiden Faculteit der Geneeskunde, Netherlands, 1956; served a residency at the Mount Sinai Hospital in New York City, Rehabilitation Hospital in West Haverstraw, N. Y., and the Bellevue Hospital Center in New York City; died in the Phelps Memorial Hospital, Tarrytown, Sept. 25, aged 36.

Wegener, Karl Frederick Ernest, Lincoln, Neb.; Chicago College of Medicine and Surgery, 1915; member of the American Psychiatric Association; retired from the Veterans Administration on Dec. 31, 1953; veteran of World Wars I and II; on the staff of the Lincoln State Hospital; died in Omaha Sept. 29, aged 75.

Winder, Harriet Owen, Ann Arbor, Mich.; University of Michigan Medical School, Ann Arbor, 1933; died Sept. 24, aged 51.

Zacher, Andrew Arthur Ⓜ Geneva, N. Y.; University of Buffalo School of Medicine, 1931; member of the American Society of Anesthesiologists, Inc.; died in Rochester July 28, aged 56.

Zeh, Merlin Jay, Watervliet, N. Y.; Albany (N. Y.) Medical College, 1889; also a pharmacist; served on the staff of St. Mary's Hospital in Troy; died in the Leonard Hospital in Troy Sept. 26, aged 92.

FOREIGN LETTERS

AUSTRIA

High Energy Radiation of Cancer.—At the joint meeting of the International Atomic Energy Agency and the World Health Organization in Vienna, it was reported that high energy radiation used in the treatment of malignant tumors can be either in the form of gamma rays, x-rays, or beams of accelerated electrons. The required gamma radiation can be obtained from large sources of radioactive materials, such as cobalt-60 (Co^{60}) or cesium-137 (Cs^{137}), while electron beams are produced by high-voltage accelerators. The experts considered the sources in four broad categories: large supervoltage units, intermediate units, small isotope units, and units of electron beams or high energy x-rays. The first group includes supervoltage x-ray units in the range of two to six million electron volts and Co^{60} units in which the radioactivity is of the order of 1,000 or more. These sources are kept at a minimum distance of 75 cm. from the tumor to be attacked. Intermediate units were defined as smaller cobalt units working at source-to-tumor distance in the range of 35 to 50 cm. The group believed that such units were not as good as the larger units. The only reason for their adoption would be one of economy. As regards small isotope units working at a distance of 25 cm. or less, it was agreed that these were of value for the treatment of certain selected sites in the body (e. g., head and neck) and that they should be made available either in addition to or in the absence of large units. Such units may be specifically designed to hold either Co^{60} or Cs^{137}.

DENMARK

Nickel Eczema.—Dr. P. V. Marcussen (*Ugesk. laeger*, Sept. 3, 1959) found that although modern precautions against nickel eczema contracted as an industrial disease have been remarkably effective, the opportunities for contracting it in private life have grown with the increasing use of nickel-treated articles of domestic use. In 1935 the contact dermatitis in only 5.2% of the author's patients could be traced to nickel; this occurred in 12.9% in 1955. He estimated that there were roughly 10,000 persons with a hypersensitivity to nickel in Denmark and that to this group about 800 newcomers must be added every year. In his analysis of 621 cases he showed that nickel-fitted garters were to blame in 406, tools and instruments in 57, wrist watches in 55, spectacles in 47, necklaces in 39, and aspirators, rings, telephones, or water taps in 17. In about 80% the primary eruption was soon followed by a secondary pruriginous or eczematous eruption. The eczema relapsed in 118 of the 621 patients, and as sensitivity to eczema is lifelong, the greatest care must be taken to prevent contacts with this metal. A ban on nickel-fitted garters should do much to prevent the disease.

Prognosis in Hodgkin's Disease.—Roos and Videbaek (*Danish M. Bull.*, vol. 6, September, 1959) studied a series of 172 patients with Hodgkin's disease treated in the period 1930-1945 and 117 treated in the period 1946-1955. The first group received x-ray treatment exclusively or in conjunction with blood transfusion. The second group had the additional benefit of therapy with cytotoxic agents, antibiotics, ACTH, and corticosteroids. The five-year survival rate for the first group was 33%, whereas it was 41% for the second group. Although this difference is statistically significant the authors' findings do not tally with those of other observers.

ECHO 9 Virus Meningitis.—In the latter half of 1958, 30 patients with meningitis were admitted to the Central Hospital in Herning where they were treated with antibiotics on the assumption that the disease might be of bacterial origin. Reporting on these patients Dr. S. Trier (*Ugesk. laeger*, Sept. 10, 1959) stated that six of the patients were under the age of 5 years and only six were over 20. The oldest was 47 years of age, and 21 were males. After a few days of general malaise, fever, headache, and anorexia the patients often rallied and were more or less symptom-free for four or five days, after which the temperature rose again and was associated with a violent headache, nausea, and vomiting. The fever lasted 3 to 12 days, and the meningeal symptoms disappeared promptly, with the exception of slight cervical rigidity which in some lasted for over a week. All the patients recovered, but it is doubtful if their recovery could be attributed to the antibiotics given. No bacteria could be isolated from these patients, but the ECHO 9 virus was found in 15. The cell content of the spinal fluid was much higher than is usually the case when meningitis is of viral origin, and in 12 patients more than 40% of the cells counted were polynuclear.

The items in these letters are contributed by regular correspondents in the various foreign countries.

GERMANY

The Sputum in Bronchial Cancer.—Otto and Grünbeck (*München. med. Wchnschr.* **101**:1595, 1959) made sputum examinations in a series of 71 patients with bronchial cancer and compared their findings with those in aspirated samples; 44 patients had positive findings in the sputum. From 80% of a group of patients with proved bronchial carcinoma the authors found tumor cells in the sputum. In several patients the sputum examination proved superior to the examination of the bronchial secretion. Contrary to the authors' previous opinion this indicated that examination of the sputum is just as useful for diagnosis as bronchial aspiration.

Mucoviscidosis in Adults.—Koch and Lapp (*Medizinische* **24**:1149, 1959) stated that mucoviscidosis (also known as fibrocystic disease of the pancreas) was formerly regarded as a hereditary disease, with a severe and rapidly fatal course, which was found only in children. Bohn and co-workers were the first to show that the disease is even more common in adults than in children. Koch and Lapp reported the clinical and pathological findings in three men who died in their 44th, 51st, and 66th years respectively. Clinically all three patients had a chronic, recurrent bronchitis with bronchiectasis, emphysema, and cor pulmonale. The cor pulmonale was the immediate cause of death. All three patients also suffered from excretory pancreatic insufficiency, with dissociation of the enzymatic concentrations and fatty stools, for years or even decades. The resultant malabsorption had given rise to tetany, osteoporosis, hypoprothrombinemia, and symptoms of pellagra. Two patients had florid duodenal ulcers. In addition an increased sodium chloride excretion in the sweat with hyponatremia and hyponatriuria could be demonstrated in all three patients. Autopsy revealed increased mucus secretion in the region of the bronchiectatic cavities, viscous mucous plugs in the mucous glands of the gastrointestinal tract, and fibrous changes in the pancreas. These findings corresponded to those of mucoviscidosis but were much less marked than in the childhood form of the disease.

Nephrosis.—Acker and Schreier (*München. med. Wchnschr.* **101**:221, 1959) said that the expectation of success in the treatment of nephrosis in children has increased greatly since the introduction of sulfonamides, antibiotics, and cortisone. In the Heidelberg clinic about 75% of patients with genuine nephrosis were cured, whereas in those with an added element of nephritis the mortality was about 50% and it was doubtful whether the remaining 50% would completely recover. The basis of treatment remains a protein-rich, salt-free, low-fat diet. In addition there are various diuretics, which, however, produce only a transient diuresis and this in only a few patients. Substances which raise the colloid osmotic pressure of the blood had a variable effect; with human albumin the excretion of protein rose markedly. Cation exchange resins and elimination of focal sepsis produced no improvement in the clinical findings.

In two patients with genuine nephrosis, infection with measles seemed to have a good effect, but in eight others infection with measles was unsuccessful. Other intercurrent infections produced an increase in the proteinuria. Use of tibione and hyaluronidase had little or no effect. Long-term drainage of the ascites or kidney decapsulation also produced no change in the clinical findings. Sulfonamides and antibiotics saved lives by combating bacterial infections which had previously accounted for most of the deaths among children with chronic nephropathies. Undoubtedly treatment with prednisone and ACTH should at least be given a trial in patients with pure nephrosis.

Tetanus.—P. Mollaret (*München. med. Wchnschr.* **101**:51-53, 1959) stated that modern methods of narcosis with purified and standardized curare preparations combined with promazine have opened up new possibilities in the treatment of tetanus. On the basis of a series of 120 patients he recommended the following principles of treatment. For mild cases with minimal generalized symptoms and no respiratory or autonomic disturbances curare, intravenous feeding, and tracheotomy are not indicated. In addition to continuous medical supervision, with quarter-hourly pulse and blood pressure readings and alteration of treatment at the first sign of deterioration of the patient's condition, he recommends treatment with bromide, chloral, diphenylhydantoin, chlorpromazine, or promethazine every four hours. Two or three of these drugs should be given at the same time. Blood CO_2 and electrolyte levels and pH should be estimated daily, and the chest should be x-rayed daily also.

For cases of moderate severity with generalized spasm, severe trismus, and dysphagia, but no fever or sympathetic or respiratory disturbances, in addition to the strictest supervision, immediate tracheotomy, intravenous feeding, and larger doses of the above-mentioned drugs are indicated. Curarization is not required. For the severest cases maximal curarization for about three weeks and artificial respiration by means of a respirator according to the volumetric principle are necessary in addition to tracheotomy and intravenous feeding. Special attention should be directed to any rise in the systolic blood pressure, slowing of the pulse rate, and sweating or chilling of the extremities. Autonomic disturbances often appear on the fourth or fifth day after the appearance of symptoms, and when this occurs blockage of the nerves with 1% procaine solution given as a subarachnoid infusion for 30 to 40 minutes at the rate of 1 cc. per minute simulta-

neously with intravenous injection of levarterenol has proved effective. This technique has reduced the mortality in this group by 30 to 50%.

Prevention of Sudeck's Atrophy.—L. Böhler (*München. med. Wchnschr.* **101**:663, 1959) stated that treatment of injuries or inflammation with plaster of paris often results in disturbances of circulation which give rise to Sudeck's atrophy. In this condition there is a rise in skin temperature, edema, and pain. Later trophic skin lesions and disturbances of growth of fingernails and toenails occur. Women over 40 years of age are not often affected. The author insists on the necessity of splitting the plaster immediately after its application, and on the importance of beginning active exercises immediately. With such treatment only four cases of Sudeck's atrophy occurred among 15,000 fractures of the radius. Primary treatment with vasodilators or cortisone instead of splitting the plaster and active exercises is contraindicated. Once Sudeck's atrophy has recurred, however, corticoids are of value.

Effect of X-rays on Cancer Cells.—O. Warburg (*Naturwissenschaften* **46**:25, 1959) drew an important therapeutic inference from the theory that the source of energy in cancer cells is not respiration, as in normal cells, but fermentation. The normal growth of body cells is a strictly aerobic process, which is upset by the least depression of respiration. The growth of cancer cells, on the other hand, is partially anaerobic. Normal cells must be grown in the body. If, for instance, fibroblasts from the heart are cultivated outside the body by Carell's method for any length of time they no longer exhibit normal metabolism but show the fermentative metabolic habit of cancer cells. The cells growing in vitro are no longer normal cells but are cancer cells or cells in the process of turning into cancer cells. In vitro culture answers the question: Which came first, the fermentation or the cancer? Fermentation takes priority, for the cells growing wild in vitro by the fermentative process are not cancer cells to start with, since on reinjection into the experimental animals they do not continue to grow.

The typical cancer metabolism consists not only in excessive fermentation but also in insufficient respiration. The fall in respiration follows the increased rate of fermentation. An important factor is the decrease in the level of catalase, a respiratory enzyme which splits hydrogen peroxide into water and oxygen. Cancer cells have a low catalase content—one result of their anaerobic habit. The authors demonstrated that as a result of their low catalase content cancer cells are more sensitive than normal cells to hydrogen peroxide. If equal quantities of H_2O are given to cancer cells and normal embryonal cells, the metabolism of the cancer cells ceases after an hour while that of the embryonal cells is completely unaffected. Since it is known that x-rays give rise to hydrogen peroxide in water in the presence of oxygen, it was only a step to the idea that x-rays, which are the most effective treatment for cancer known to modern medicine, must exert their injurious effect on cancer cells simply by means of H_2O_2 and selectively at that since cancer cells contain less catalase than normal cells.

The proof of this theory was conducted along two lines. If chemically pure catalase is added to the cancer cells in small quantities prior to irradiation then their sensitivity to x-rays is greatly diminished. Other experiments showed that a given dose of irradiation could be completely replaced by the corresponding dose of H_2O_2. This is unequivocal proof that the effect of x-rays depends on the formation of H_2O_2. Red blood corpuscles are rich in catalase. For this reason it is important to eliminate red blood cells from the cancer as far as possible while it is being irradiated, since otherwise the catalase from the erythrocytes makes the cancer cells more resistent to x-rays. The irradiated parts must therefore be perfused with some fluid which is free of red blood cells but still contains an excess of oxygen—no easy problem but one which, in the present state of perfusion technique, is not insoluble.

Tuberculosis in Multiparas.—L. Mattern (*Tuberkulosearzt* **13**:45, 1959) studied a group of 276 women who had had one or more confinements while suffering from pulmonary tuberculosis. Of these, 96 (34.78%) showed no change in their tuberculosis during pregnancy and the puerperium, 96 showed some improvement, 24 (8.77%) showed a deterioration in their condition, and 60 (21.73%) discontinued treatment. The incidence of exacerbations during pregnancy or in the puerperium was no higher in these women than among primigravidas. Of the total number, an exacerbation of tuberculosis which was present before pregnancy was observed in 12.03% (during the first trimester) and in 7.9% in the puerperium. Tuberculosis was first discovered during pregnancy in 6.97%. In more than 50% the pregnancy had no apparent effect on the tuberculosis.

SWEDEN

Influenza Virus in Cattle.—Investigations at the Swedish Institute of Veterinary Medicine, by K. Bakos and co-workers, of a disease among cattle showed that the virus causing this disease was identical with that causing parainfluenza 3 in human beings. The cattle disease was especially prevalent in northern Sweden and appeared in two main forms, one with intestinal and one with respiratory symptoms. It was thought that para-

influenza 3 might be the primary cause of the so-called transport disease, an infectious disease which has been found among cattle in the United States and the cause of which had been believed to be a Pasteurella.

Relationship Between Measles and Distemper.—Comparative studies between the distemper virus and the measles virus were made by Dr. Gun Carlström of the Karolinska Institute. She found that human beings who have had measles have antibodies against distemper and that injection of distemper virus in animals was followed by immunity against measles as well as against distemper. Comparisons between the two viruses showed that in spite of some differences they were closely related.

Sweden's Largest Hospital.—The recent inauguration of the central complex of the Sahlgren Hospital in Gothenburg, which is to serve as the teaching hospital of the University of Gothenburg, marks the peak of a 10-year rebuilding program. It makes the Sahlgren complex the largest hospital in Sweden (2,000 beds), and its technical planning and equipment is of a standard probably unequalled in the world. One of its most striking features is its battery of 26 operating rooms, all provided with two operating tables, so that there need be no time wasted between operations. Anesthesia is induced in special rooms, one for each operating room. A high degree of automation has been achieved in the x-ray department which is equipped to handle 60,000 examinations a year with fewer technicians than formerly required. The blood center has about 16,000 registered blood donors and can collect 100 donations a day. The serology department makes almost as many cross-matching tests. The air in the operating rooms is fully renewed every six minutes. All equipment, as well as the floors, has been made electricity-conducting. The oxygen, compressed air, and anesthetic gases are administered from a central depository in the basement and connected with the operating rooms by means of a pipeline system which has convenient wall outlets.

UNITED KINGDOM

Prince Philip, President of the British Medical Association.—Prince Philip, Duke of Edinburgh, was installed as the President of the British Medical Association. The ceremony should have taken place in July at the Annual Meeting of the Association in Edinburgh, but was delayed owing to the presence of Prince Philip and the Queen in Canada. Among those present were Sir Arthur Porritt, the president-elect; Sir Arthur Thomson, the retiring president; Dr. E. Kirk Lyon, deputy president of the Canadian Medical Association; and Dr. Louis Orr, president of the American Medical Association. After being installed as president, Prince Philip delivered an address in which he referred to the BMA as a bulwark of freedom and democracy and complimented it on the useful work that it was doing for the medical profession.

Medical History Faculty Founded.—A Faculty of the History of Medicine and Pharmacy was founded under the auspices of the Worshipful Society of Apothecaries of London. Its aim is to extend interest in medical history. No such body has hitherto existed in Britain. There are endowments for three lectureships and a research fellowship is endowed by the Wellcome Trustees.

New Research Center.—A new research center costing 2.1 million dollars was opened in Nottingham by Boots Pure Drug Co. Ltd., the manufacturing chemists and retail pharmacists. There are 24 laboratories for research in pharmacology and chemotherapy and for analytical and control work in the bioassay and microbiology divisions of the company's standards department. There is also a library of 25,000 volumes in the building, a lecture theater seating 200, and a radioactive isotope unit.

Working After Sixty-Five.—In Britain a number of men continue to work after the pensionable age of 65, most of them from economic necessity. How many are really fit to continue working after this age has never been ascertained. Edwards and coworkers investigated the question with the help of a team of Birmingham general practitioners (*Brit. J. Prev. Med.* 13:51-59, 1959). In a survey made of the health of a sample of men over 70 years of age it was found that the main causes of illness were bronchitis, ischemic heart disease, and arthritis. Hypertension, hernia, and peptic ulcer were also prevalent, although they caused much less disability. With the exception of bronchitis, the incidence of these conditions was unaffected by social class. Arthritis was the only disease that increased in frequency with advancing years.

Fitness for work in the elderly man depends not only on his health but also on the nature of his work. Of the men over 70 years of age in social class 1 (professional class) 67% were considered to be fit for full-time work, and of these 33% were working. By contrast only about 20% of the men in social class 5 (unskilled workers) were passed as fit for their particular type of employment. In spite of this many were still working because of sheer economic necessity. The difference in fitness in the professional and unskilled classes was largely due

to the high prevalence of chronic bronchitis in the latter. The men were also questioned about their pursuits. Gardening was the chief one. Most of the men had a good appetite and enjoyed their food. About 67% were under some form of medical supervision, but only 5% required active medical or surgical treatment; 7% were sufficiently disabled to need assistance with washing, dressing, and eating. About 50% required domestic help.

Shortage of Dietitians.—The British Dietetic Association has set up a fact-finding committee of members to inquire into the shortage of dietitians, particularly in the National Health Service. The committee's interim report says that a request was sent to hospital management committees and boards of governors of teaching hospitals asking for information on the employment of dietitians. In 100 groups of hospitals no dietitians were employed. In 314 hospital groups with 391 positions available as full or part-time dietitians and catering officers, only 279 were filled. As the number of students qualifying each year as dietitians is about 45, the shortage is likely to continue.

Hospital Accident Services.—The British Orthopedic Association states, in a memorandum on accident and casualty services, that in certain areas hospital accident services are a blot on the National Health Service. As a result of the memorandum representatives of the Royal Colleges of Surgeons of England, Edinburgh, and Ireland, the Royal Faculty of Physicians and Surgeons, Glasgow, and the College of General Practitioners will meet to discuss the problem. Mr. H. J. Seddon, president of the British Orthopedic Association, said in a press interview that an advisory team will be set up to visit the various areas. The broad outline of the scheme being considered is to reduce the numbers of hospitals to which casualties are taken and to have an around-the-clock accident service at certain designated hospitals only. At present, persons involved in accidents may be sent to any hospital where expert treatment for the particular injury sustained may or may not be available. In London, although there are over 100 hospitals where casualties may be taken, few are fully equipped to deal with serious accident cases. The result is that treatment is delayed because the patient must be transferred to another hospital, or if treatment is given it is not the best. The new scheme would equip 20 to 30 hospitals to deal with any accident, however severe, and to give the best possible treatment.

Mr. Seddon said that two types of hospital were envisaged. There would be a centrally located general hospital, preferably a teaching hospital, which would have an accident unit with all its facilities and specialist staff, including orthopedic, plastic, general, and neurosurgical, who would be available at all hours of the day. The unit would have its own pathological and radiographic service and its own operating suite. A "flying squad" would be ready to go to any hospital of the second type situated in the periphery. Peripheral hospitals would receive and treat casualties and would refer only serious or complicated cases to the central hospital. The chief of the accident unit need not necessarily be an orthopedic surgeon, although most accidents come within this field and the scheme need not require increased staff, only reorganization.

Dr. James Fairley, the Southeast Metropolitan Regional Hospital Board's senior medical officer, objected on the ground that it is not practicable to reserve 150 to 250 accident beds for each 500,000 of the population as suggested. Even the large London hospitals could not do this, as at any one time a number of these would be empty. He suggested that the central hospitals might give the initial specialist treatment, and then if there is pressure on bed space, the patients could be transferred to convalescent units. At one center that has been set up the period of hospitalization for minor accidents has been reduced from 21 to 5 days.

Factory in a Mental Hospital.—Eighteen months ago factory work was started in Goodmayes Mental Hospital, Ilford, Essex. The object was to provide some form of activity for the patients and remuneration to add interest to the work. The scheme was so successful that it was expanded to provide paid work for about 150 patients. Originally 36 chronic, refractory, and deteriorated mental patients, most of whom were schizophrenic, were found working, although they were not compelled to do it. They were given mica to split and sort. Simple jigs and equipment were provided for the work. Payment was based on output, and when this could not be conveniently estimated the output of a team was calculated. The patients have split 750 kg. of mica, made 150,000 boxes and 10,000 carrier bags, stuck 44,000 labels, painted several hundred toys, and counted and bundled millions of punched-out cardboard shapes from which boxes are made. In the first year these patients earned $870. The rates of pay are low, but the money provides an interest and incentive.

After a year's employment in the hospital the average patient slept better; was less restless, talkative, and aggressive; worked with less supervision than at the conventional hospital occupational therapy; and was more cooperative and friendly. About 75% of the patients judged on these criteria were improved and the rest unimproved or worse. The latter group were passive, inert, and lacked the will to do anything, but few patients now sit idly about, and quarrels between the patients are infrequent as most of them are too occupied with their work. Arrangements were made for selected patients to go to factories outside the hospital to work for short periods under protected conditions.

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CORRESPONDENCE

BIZARRE INTOXICATIONS

To the Editor:—In THE JOURNAL, Nov. 7, page 1342, Green's paper on nutmeg poisoning is timely, in that, along with plastic "glue glugling" and gasoline sniffing, Myristica fragrans is being used by teen-agers and perhaps even smaller fry as the means for achieving intoxication inexpensively. The taking of nutmeg mixed with water, an old practice among narcotics addicts, was reported in *Today's Health*, October, 1959, page 78, and on one occasion I saw some teen-agers "spike" their beer with it. Although I have had no nutmeg addicts as patients, I have seen about every other kind. Of special interest at the moment is a 6-year-old child, who was brought to my office recently so inebriated he could not stand. His mother said that he had been addicted to sniffing gasoline for 18 months. I would appreciate hearing from other physicians who have seen similar patients. The inhalation of gasoline fumes seems to be a craze among very young children in my community at the moment.

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RECURRENT POLYSEROSITIS

To the Editor:—In THE JOURNAL, Aug. 22, page 2131, Drs. Priest and Nixon refer to the editorial in the June 6 issue, page 678, on familial periodic disease, proposing for it the name "familial recurrent polyserositis." Our experience with this disease dates back to 1946, when we reported two cases to the Jerusalem branch of the Israel Medical Association. Since then we have studied more than 50 cases. In view of the fact that the fundamental feature of the disease is a recurrent inflammation of the serous membranes, we called it "recurrent polyserositis," which is in agreement with the suggestion of Drs. Priest and Nixon. An objection might be made to the addition of the adjective "familial." It is true that familial occurrence is not infrequent, but it varies widely in different reported series and is not necessarily an integral feature of the disease. In most of the patients we have seen, only one member of the family was affected.

In 1958 we reported (*Israel M. J.* **17**:150 [July-Aug.] 1958) that some patients with recurrent polyserositis exhibit marked hypersensitivity to old tuberculin. This was demonstrated by their positive skin reactions to dilutions as high as 1:100,000,000 and by the fact that attacks, indistinguishable from the spontaneous ones, could be provoked by the intradermal injection of minute amounts of tuberculin. Desensitization, carried out in two patients, resulted in remissions for as long as two years. This observation led to the assumption that the attacks of recurrent polyserositis are manifestations of a hyperergic state. The occurrence of amyloidosis in some patients is consistent with the allergic concept of the disease. Our experience in this respect is similar to that of the American authors in that we have seen only a few patients with this complication.

There is a finding which may sometimes be helpful in the diagnosis of the disease, especially in view of the paucity of physical signs in the intervals between the attacks. About 50% of the patients have colloid body–like dots in the ocular fundi (Michaelson and others: *A. M. A. Arch. Ophthalmol.* **62**:1 [July] 1959). The underlying cause of this finding has not yet been established.

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DIHYDROSTREPTOMYCIN OTOTOXICITY

To the Editor:—I have read the article "Dihydrostreptomycin Deafness" in THE JOURNAL, Aug. 1, page 1657, reporting 32 cases of deafness occurring after the administration of dihydrostreptomycin or products containing this substance associated with other antibiotics. I should like to mention the possibility of the reduction of dihydrostreptomycin ototoxicity by the addition of pantothenic acid or sodium pantothenate. In this way we can employ the beneficial action of dihydrostreptomycin, especially in tuberculosis. Some bibliographic references are included.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Use of a Combined Preparation of Penicillin, Sulfonamides and Aminopyrine in the Prophylaxis of Rheumatic Disease. C. Chierego. Policlinico (sez. med.) **66**:345-357 (Aug.) 1959 (In Italian) [Rome].

A combined preparation of benzathine penicillin G, sulfathiazole, sulfisoxazole, and aminopyrine was administered as a prophylactic drug against rheumatic fever to 46 secondary school children, aged between 11 and 14 years, whose standard health questionnaires indicated a regressed or current state of rheumatic disease or suspected presence of a local (oropharyngeal) infection. Treatment was conducted for 16 months, with a 4-month drug-free period in between. The preparation was administered for 4 consecutive days a week in the form of 3 tablets a day, each tablet containing 150,000 units of benzathine penicillin G, 125 mg. of sulfathiazole, 125 mg. of sulfisoxazole, and 150 mg. of aminopyrine.

Pain in the joints, which was present in 29 pupils (63%) at the beginning of treatment, affected only 4 at the end of such treatment; tonsillar infection, which was present in 42 pupils (91.3%) at the beginning, affected only a few at the end of the treatment. The effect of the prophylaxis was evaluated objectively on the basis of the tests recording antistreptolysin titer, C-reactive protein level, and erythrocyte sedimentation rate at the beginning and at the end of each course of treatment and 3 months after the termination of the therapy (5 courses altogether). The serologic tests were carried out in those who received the prophylactic treatment and in a control group of 40 children who had a current rheumatic or tonsillar involvement but had not received the prophylactic treatment. The values of the serologic tests were above the physiological limits when the treatment began in both groups of children. These values were restored within the physiological limits in the group who received the treatment, but they remained almost unchanged in the control group at the end of the treatment. No severe side-effects to the drug were observed. A temporary episode of slight diarrhea affected 2 pupils, and slight nausea 1.

The Nature and Prognosis of Heart Disease in Thyrotoxicosis: A Review of 150 Patients Treated with ^{131}I. G. Sandler and G. M. Wilson. Quart. J. Med. **28**:347-369 (July) 1959 [London].

Although the occurrence of heart disease in thyrotoxicosis is recognized, opinions are still divided about the relationship of thyrotoxicosis to the genesis of the cardiovascular abnormalities. While some authors have maintained that thyrotoxicosis alone can cause heart disease, others have claimed that associated heart disease is always present in such patients in addition to thyrotoxicosis. The authors selected for detailed study patients with cardiac involvement from among a large group of patients with thyrotoxicosis who had been treated with radioiodine (I^{131}). Evidence of heart disease was present in 150 of 462 thyrotoxic patients treated with I^{131} at 2 Sheffield hospitals between 1949 and 1956. Eighty-six of these patients had associated heart disease, comprising ischemic, hypertensive, rheumatic, pulmonary, and congenital heart disease. The remaining 64 patients had auricular fibrillation, congestive cardiac failure, or cardiomegaly alone, in the absence of any clinical, radiologic, or electrocardiographic evidence of associated heart disease. Patients with cardiac involvement were found in the older age groups. Sex, incidence of goiter, and severity and duration of thyrotoxicosis did not appear to be related to the incidence of cardiac involvement. Approximately one-third of the patients with auricular fibrillation reverted spontaneously to normal rhythm after I^{131} therapy, the most important factor adversely influencing reversion being the presence of congestive failure. The rate of reversion was higher in younger patients and in male patients.

More than half of the patients with congestive cardiac failure had no further attacks of failure after I^{131} therapy, and more than one-third required no further treatment with digitalis or mersalyl. The prognosis in patients with congestive failure and auricular fibrillation was more favorable if sinus rhythm was restored. In 13 patients without associated heart disease, there was radiologic and electrocardiographic evidence of left ventricular enlargement in the absence of auricular fibrillation and congestive cardiac failure. A return to normal did not occur after I^{131} therapy.

The place of publication of the periodical appears in brackets preceding each abstract.

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Postmortem studies were carried out in 9 patients. Three of these had had evidence of associated heart disease during life. The clinical diagnosis of cor pulmonale in 2 patients and of hypertension in 1 was confirmed at autopsy. The remaining 6 patients had auricular fibrillation and congestive cardiac failure during life, but no clinical evidence of associated heart disease. One of these 6 patients, who died of carcinoma of the rectum, showed no evidence of cardiovascular disease on autopsy. In one of the remaining 5 patients coronary atherosclerosis was present; in another patient there was slight coronary atheroma, not considered sufficient to produce the marked cardiac disturbance during life; in 3 patients moderate to marked hypertrophy of one or both ventricles existed, but no other possible etiological factor producing heart disease, apart from thyrotoxicosis, was found. Thus, in 4 of the 9 cases in which autopsy was performed, no cause of heart failure other than thyrotoxicosis was found. The authors conclude that, although thyrotoxicosis may not be the sole cause of the cardiac disability, in many patients with thyrotoxicosis and heart disease it is nevertheless the predominant factor. I^{131} therapy is safe and effective, and is the treatment of choice in thyrotoxic patients with severe cardiac complications.

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Treatment of Rheumatoid Arthritis by a Sanatorium Regime: The Black Notley Experiment. R. M. Mason and W. G. Wenley. Ann. Rheumat. Dis. **18**:91-99 (June) 1959 [London].

The authors report on a pilot experiment that was set up to determine whether the treatment of rheumatoid arthritis by sanatorium methods was likely to make a useful contribution to the management of this disease. For the past 4 years 10 beds for female patients, which were previously used in tuberculosis treatment at the Black Notley Sanatorium, have been made available to the authors. During this time 40 patients with severe rheumatoid arthritis were admitted for an average stay of 6½ months. They were treated along standard sanatorium lines, with prolonged rest in bed, as much out-of-doors as possible, and with suitable splinting. This group of patients had a longer duration of disease than those admitted to beds in a London hospital during the same period (an average of 9.4 years, compared with 7.5). A comparison of the sanatorium group with other comparable groups shows that they represented a more severely affected group, as measured by functional capacity and course of disease before admission, although there were no significant differences in the degree of disease activity.

At the time of discharge there was a significant improvement in the sanatorium patients in functional capacity, the proportion only partially disabled increasing from 50 to 68%, and the proportion completely incapacitated decreasing from 50 to 24%. At follow-up (average time, 17 months), further improvement in functional capacity was observed. Improvement in disease activity also took place, although this improvement was less than that in functional capacity. Severe incapacity appeared to be no contraindication to admission to the sanatorium regimen, but the functional capacity of patients with a short duration of disease improved more than that of those with a long duration of disease. This experiment suggests that sanatorium treatment of rheumatoid arthritis is worth pursuing, but that much greater emphasis should be placed on adequate rehabilitation procedures.

The Significance of Pleural Effusion. S. K. Sweany. Illinois M. J. **116**:123-128 (Sept.) 1959 [Chicago].

Pleural effusion should never be regarded lightly, and every attempt ought to be made to establish the causitive etiology. The presence of pleural effusion accompanying an illness should be suspected when there is chest pain with respiratory movement. This situation demands a roentgenologic examination of the chest, which should be repeated 2 weeks later, since the first chest film may not reveal early changes. When an effusion is suspected, physical examination will support this suspicion by dulness to percussion, decreased breath sounds, and vocal fremitus over the involved side.

Tuberculosis and carcinoma are the 2 most important conditions that produce pleural effusions. An effusion appearing insidiously, especially in a young person, should be considered tuberculous until proved otherwise. Yet it is not uncommon for an effusion appearing in a person 40 years of age or older to be tuberculous. The onset may be abrupt, but usually is insidious, and often is accompanied by fatigue, weight loss, and low-grade fever. The tuberculin skin test usually is strongly positive, but it may be negative during an anergic phase. It may be wise to repeat the skin test after 2 to 4 weeks. It is important to establish the tuberculous nature of the effusion, because proper use of antituberculous chemotherapy is curative, and nontreatment results in active open disease in more than 50% of the cases within 2 years. Effusions produced by malignancies are characterized by a tendency to produce ever increasing amounts of fluid, and generally by a downhill course. They occur more commonly in the older age group and usually are insidious in onset. The character of the fluid will vary, depending upon whether there is direct invasion of the pleural space with tumor or whether the fluid is the result of dynamic pressure changes from vascular occlusion by the tumor. With direct invasion, the fluid has a higher specific gravity, is frequently bloody, and often has malignant cells in the sediment. Pleural invasion with carcinoma car-

ries a hopeless prognosis, but can be ameliorated with the use of nitrogen mustard and radioactive heavy metal solutions.

The value of pleural biopsy by both needle and open surgical technique is emphasized. The author discusses the results obtained from 106 needle-biopsy specimens in 88 patients. In 10 patients malignancies were demonstrated by needle biopsy. In 10 additional patients malignancies were subsequently discovered by other means from 6 months to 3 years later. Thus, in the presence of malignancies the diagnostic yield of pleural needle biopsy was 50%. Granulomatous pleuritis with giant-cell formation and sometimes caseation and acid-fast bacilli were detected by biopsy in 13 cases. Only one of these was not confirmed by finding the organism later, but even this patient responded to antituberculous chemotherapy. Thus, biopsies yielded positive diagnoses in 26% of the 88 cases. These diagnoses are obtained with minimal trauma to the patient, and with saving of both time and money in shortened hospitalization and fewer diagnostic procedures.

The Significance of Respiratory Symptoms and the Diagnosis of Chronic Bronchitis in a Working Population. C. M. Fletcher, P. C. Elmes, A. S. Fairbairn and C. H. Wood. Brit. M. J. 2:257-266 (Aug. 29) 1959 [London].

The diagnostic problem of chronic bronchitis was studied by asking 192 postmen and 192 female post-office employees of London, 40 to 59 years of age, a number of questions regarding cough, expectoration, and other symptoms, by measurement of sputum volume and of ventilatory capacity, and by inspection of sickness-absence records. The men had more cough and sputum than the women, but the prevalence of other symptoms and of chest illness was similar in the 2 sexes. Symptoms increased with age in the men but not in the women. These differences were only partly attributable to differences in smoking habits. The severity of phlegm production was graded according to whether or not it occurred throughout the day, and this grading correlated well with the volume of sputum produced in the first hour after waking. Whether or not the phlegm was said to be perennial appeared not to matter. Ventilatory capacity was significantly impaired in the men, but not in the women, who had the higher grade of phlegm production, frequent wheezing, susceptibility to adverse weather, and a history of chest illnesses with an increase of phlegm production.

The authors suggest that chronic bronchitis should be diagnosed in subjects with a productive cough not due to other causes, and that it should be graded in severity either according to the persistence of the symptom throughout the day or according to the volume of sputum expectorated. Disability from impairment of ventilatory capacity or recurrent chest illnesses should be regarded as complications, and not as essential features of chronic bronchitis, since it is important to recognize the disease before it has resulted in disability. The disabling form of the disease can be referred to as "chronic bronchitis with ventilatory impairment" and "chronic bronchitis with recurrent exacerbations" and may be graded according to the severity of the impairment and the frequency of exacerbations. Disability appears to be a less frequent consequence of chronic bronchitis in men than in women.

Bronchial Changes in Hodgkin's Disease (Malignant Granuloma). C. Dijkstra. Nederl. tijdschr. geneesk. 103:1516-1521 (July 25) 1959 (In Dutch) [Amsterdam].

On the basis of detailed histories of 3 patients, the author demonstrates that granulomatous changes may be found in the bronchi of patients with Hodgkin's disease. While ordinarily these lesions may be relatively unimportant in the over-all clinical picture of Hodgkin's disease, the cases presented illustrate that they sometimes give rise to atelectasis and pneumonitis of a part or of an entire lung and thus have a decisive influence on the course of Hodgkin's disease. One of the patients presented had tuberculous pulmonary lesions in addition to the lymphogranulomatous bronchial lesions.

Familial Hemolytic Anemia with Erythrocyte Inclusion Bodies and a Defect in Pigment Metabolism. R. Schmid, G. Brecher and T. Clemens. Blood 14:991-1007 (Sept.) 1959 [New York].

The authors report on 2 patients, a 35-year-old man and his 11-year-old son, with a congenital and familial hemolytic syndrome, which was characterized by the presence of spontaneous inclusion bodies in the erythrocytes and by the excretion of dark-brown pigments in the urine. Splenectomy did not improve the marked hemolytic anemia in either patient. The father had an acute attack of biliary obstruction due to multiple gallstones in the common bile duct. He died after a surgical attempt to relieve the obstruction. The son had an aplastic crisis, occurring in the course of a pneumonitis of undetermined causation, during which frequent transfusions were necessary to maintain an adequate hemoglobin level. Associated with this attack was a transient disappearance of the urinary pigments and a decrease in the serum bilirubin level. The patient gradually recovered, and in the fall of 1958, when this report was submitted for publication, he was leading a normal life and maintaining a hemoglobin level of about 10 Gm. per 100 cc.

Special studies at the National Institutes of Health in Bethesda, Md., revealed that the inclusion bodies present in about 33% of the erythrocytes

of both patients were indistinguishable from Heinz-Ehrlich bodies. They occurred in reticulocytes and occasionally in normoblasts. In addition to these bodies, many erythrocytes contained basophilic stippled cells, siderocytic granules, and rod-like structures. These morphologic abnormalities are believed to be the result of an inherited metabolic abnormality of the red blood cells. The urinary pigments were found to have chemical and spectroscopic properties which were similar to those of mesobilifuscin. It is believed that these pigments possessed a dipyrrolic structure and were derived from erythrocyte catabolism. Transfusion of the older patient's erythrocytes into a normal recipient resulted in rapid removal of the heterologous cells from the circulation and in excretion of similar dark pigments in the urine.

The Incidence of Leukemia in Families of Patients with Hypoplasia of the Marrow. S. Garriga and W. H. Crosby. Blood **14**:1008-1014 (Sept.) 1959 [New York].

The authors collected from the literature 66 cases of Fanconi's syndrome of hypoplasia of the bone marrow, involving 48 families. Among these families there were mentioned 4 cases of leukemia—2 of them in cousins, 1 in a brother, and 1 in an uncle; in one patient with Fanconi's syndrome acute leukemia developed after the patient had been ill for 4 years with hypoplastic disease of the marrow. Atrophy of the spleen is a common fault in patients with Fanconi's syndrome and may reflect a generalized dystrophy of the tissues of mesenchymal origin. The high incidence of leukemia in the families of patients with hereditary hypoplasia of the bone marrow suggests that the hereditary fault which permits development of Fanconi's syndrome may also cause a predisposition to leukemia, even among those in whom the gene is not so completely expressed as to cause Fanconi's syndrome.

Infectious Mononucleosis: A Review of 572 Cases. F. T. Lou. Chinese M. J. **79**:175-177 (Aug.) 1959 [Peking].

The authors report on 572 patients with infectious mononucleosis, who were observed in the course of an epidemic in Shanghai, which reached its peak during November and December, 1954. Most of the patients were young persons, aged less than 25 years. The clinical features were comparable to those reported in the world literature, except for certain differences, such as the high incidence of an acute onset and of gastrointestinal symptoms, generalized enlargement of lymph nodes, and occurrence of parotitis and epididymo-orchitis. Treatment was essentially symptomatic; several antibiotics and sulfonamides were given a therapeutic trial, and no remarkable difference in effectiveness was found.

Serial hematological observations revealed that the total white blood cell counts generally increased during the first 2 or 3 days of infectious mononucleosis and returned to normal limits or decreased after the 3rd or 4th day. Lymphocytes were increased after the 3rd or 4th day, with the absolute counts usually varying between 3,000 and 4,000 per cubic millimeter, the highest being 12,040. Morphologically, the abnormal lymphocytes were similar to those described by Downey. The abnoral lymphocytes persisted for 2 months at least, but only rarely for more than 4 months. Serologic observations showed that titers of heterophilic agglutinins above 1:64 were found in 96.4% of the patients. The diagnosis was further confirmed by adsorption tests in 86.5%. Attempts to isolate the causative agents from the patients' blood, bone marrow, cerebrospinal fluid, urine, and feces by culture proved unsuccessful. Proliferation of lymphoid tissue and reticuloendothelial cells and infiltration of large-sized mononuclear cells were found on examination of a few specimens of lymph node, salivary gland, and liver tissue obtained from these patients.

Autopsy was performed on a patient who died of infectious mononucleosis. Scattered hemorrhages, degeneration and necrosis of parenchymal cells, and infiltrations of mononuclear cells in the liver, kidney, and adrenal cortex were seen. Multinuclear giant cells were found in several tissues. Abnormal changes of the heart, brain, stomach, and intestines were evident.

Essential Thrombocythemia: Eight New Cases, Together with Follow-up Examination of Owren's Patient. J. Deduchen, O. Refvem and K. Ytrehus. Nord. med. **62**:1265-1270 (Aug. 20) 1959 (In Norwegian) [Stockholm].

Not many cases of essential thrombocythemia have been published to date. The authors describe 8 new cases of the disease in detail and include a follow-up study of Owren's case, reported in 1943. Owren's patient was found to be subjectively free from symptoms. A familial type of hemorrhagic diathesis was seen in only one instance. The time from the first marked manifestation to diagnosis ranged from 2 to 10 years, and averaged about 4 years. Up to now the duration of the disease has been from 4 to 35 years. Two patients probably died of myocardial infarction after 4 and 6 years respectively. Hemorrhage occurred in 5 patients, and thrombosis in 4, but only 3 patients had both of these symptoms. There were considerable neurasthenic disturbances in 4 patients. Essential thrombocythemia should be suspected, particularly in patients, aged 40 to 50 years and older, in the presence of one or more of the following symptoms, if they are not otherwise explained; (1) recurrent bleeding in skin, nose, mouth, and especially inner organs; (2) tendency to thrombosis; (3) enlarged spleen and/or

liver; (4) neutrophil leukocytosis; (5) increased number of megakaryocytes in the bone marrow; (6) paresthesias (including restless legs); and (7) slight proteinuria accompanied by increased uric acid in serum. Several cases illustrate the importance of having the possibility of essential thrombocythemia in mind.

SURGERY

Stereotactic Surgery in Parkinson's Disease. R. H. Strassburger and L. A. French. Minnesota Med. 42:1214-1218 (Sept.) 1959 [St. Paul].

The authors report on 14 patients, between the ages of 41 and 70 years, with Parkinson's disease of from 3 to 38 years' duration, who underwent stereotactic surgery at the University of Minnesota Hospitals in Minneapolis. The term "stereotactic surgery" is used for the surgical technique in which circumscribed, destructive lesions are placed in subcortical ganglions or pathways with negligible injury to adjacent structures. This is accomplished through the use of electrodes whose placement in the depths of the brain are precisely determined by mechanical guides. The first stage of the Spiegel-Wycis method of stereotaxis, adapted and employed in this group of patients, was carried out with the aid of general anesthesia and was devoted to obtaining accurate roentgen-ray studies necessary for the localization of the intracerebral target. The second stage was conducted with the aid of local anesthesia and was devoted to study of the target area by means of stimulation and observation of the clinical response patterns of evoked potentials, and destruction of the globus pallidus by coagulation with direct, anodal current.

Four of the 14 patients obtained excellent results, with 95% or better reduction of both tremor and rigidity. Five patients obtained good results, with 66% reduction of these symptoms. Three patients obtained fair results, with 33 to 66% reduction of symptoms. The 2 remaining patients were therapeutic failures, one because of permanent hemiparesis, and the other because of death which occurred 2½ weeks postoperatively after a pulmonary embolus. The age of the patients and the duration of the disease, while undoubtedly influencing the results of surgical treatment, did not necessarily preclude satisfactory results, since a 70-year-old patient obtained excellent results, and 4 patients with symptoms of 20 years' or more duration obtained either good or excellent results.

There are 4 distinct advantages to stereotactic surgery, utilizing the described technique: 1. It is an exceedingly accurate method. Destructive lesions of known size can be placed in a predetermined place with a minimum of damage to surrounding structures. 2. Before any destructive lesion is made, it is possible to carry out electrostimulation. This has the advantage of a physiological demonstration of the position of the electrode. 3. There is precise control over the size of the destructive lesion made. One coagulation produces an ovoid area of destruction of about 4-by-2-mm. size. Six to 22 lesions have been produced in various patients, the end-point being the desired clinical effect rather than an arbitrarily chosen number. 4. Reapplication of the stereoencephalotome in a precisely identical position is a simple matter. Therefore, one is able to produce further lesions at intervals, should this prove necessary. Reapplication of the instrument has been necessary in a few patients at intervals of up to 6 months, and it has been possible to do so without the need for repeat pneumoencephalography. It is felt that more data must be accumulated in order to evaluate properly the place of surgery in diseases of abnormal movements.

An Evaluation of the By-pass Graft in Arteriosclerotic Occlusive Disease of the Femoral Artery. E. F. Bernstein, J. C. Rosenberg and A. P. Thal. Minnesota Med. 42:1237-1242 (Sept.) 1959 [St. Paul].

The authors report on 29 men and 10 women, between the ages of 40 and 90 years, on whom 42 femoropopliteal bypass grafts were performed for arteriosIcerotic occlusive disease of the femoral artery in the department of surgery of the University of Minnesota Hospitals in Minneapolis. Of the 42 bypass procedures, an autogenous saphenous vein was utilized for the shunt in 18, and Edwards-Trapp crimped nylon prosthesis in 23, and an Ivalon graft in 1. All the patients were followed either until failure was evident, or for a minimum period of 12 months of palliation, which was arbitrarily chosen as sufficient to justify the procedure inasmuch as these patients were operated on either for the alleviation of symptoms or to postpone amputation. There were 3 operative deaths (7.1%). Nineteen of the 39 patients had 12 months of symptomatic relief after their operation which, therefore, was considered successful. Fifteen of the 19 patients continued to have evidence of patent graft to date; in the other 4, evidence of graft failure developed subsequently, 12, 15, 19 and 23 months after the operation. The remaining 20 patients were classified as graft failures during the first postoperative year. Nine patients were subjected to major amputations after femoral bypass on the same extremity. It is significant that, whereas the greatest number of failures occurred during the first 3 postoperative months, there was a gradual increase in the failure rate through the first postoperative year.

Arteriosclerotic occlusive disease of the femoral artery is a slowly progressive condition which may lead to claudication, gangrene, and the occasional

loss of the extremity. The alleviation of symptoms is the only indication for direct arterial surgery in these patients. More careful selection of patients for femoral bypass must be employed in the future. The risk in patients with diffuse arteriosclerosis is considerable, even for relatively minor procedures. Patients over 70 years of age will rarely be candidates for this procedure. Patients with diabetes mellitus or gangrene were rarely benefited in this series. The importance of adequate preoperative femoral arteriograms is stressed. The distal arterial bed must be shown to be patent by preoperative examination or by distal operative angiography for successful results to be anticipated. The use of serial angiographic techniques and biplane studies have been suggested as 2 methods of achieving this end. Teflon and Dacron appear to be the most promising prosthetic materials currently available. The venous autograft still appears to have a place in the femoral bypass procedure. There was a high incidence of occlusion with the Edwards-Trapp nylon graft in this series. With more careful preoperative selection, better arteriographic evaluation, more meticulous operative technique, and more reliable prosthesis, a greater number of good results may be expected in patients subjected to femoral bypass in the future.

Breast Abscess as a Threat to Surgical Units in a General Hospital. J. G. P. Hutchison. Brit. M. J. 2:277-279 (Aug. 29) 1959 [London].

Breast abscess is frequently a postpartum condition. If confinement takes place in a maternity hospital, the organism responsible, Staphylococcus pyogenes var. aureus, will most often be one of the antibiotic-resistant types prevalent there. Disease does not supervene until some weeks after the patient's discharge from the hospital. The author made a survey among 75 patients with breast abscess admitted for surgical treatment to a general hospital during 1958. Sensitivity to antibiotics, phage type of staphylococci isolated, and the patient's history before admission were studied. The majority of strains came from women confined in hospital. Only 5% of these were fully sensitive to antibiotics. Many of the strains were resistant to 2 or more antibiotics, and the phage types of the latter strains were predominantly types 80 and 52/52A/80. Conversely, in the nonpuerperal group the majority of strains were fully sensitive, and no strain was resistant to 2 or more antibiotics. The author believes that patients with puerperal breast abscess should be removed from maternity hospitals to infectious disease hospitals rather than be nursed on general surgical wards. A plea for notification of postpartum infections is also made. The apparent use of penicillin as the first line of defense in these cases is deprecated.

Lateral Portacaval Anastomosis for Portal Hypertension: Long Term Results in 57 Patients with Intrahepatic Portal Bed Block and 8 Patients with Extrahepatic Portal Bed Block. T. B. Patton, C. G. Johnston, C. Lyons and P. Jordan Jr. Am. J. Gastroenterol. 32:291-310 (Sept.) 1959 [New York].

The authors report on 65 patients with portal hypertension, on whom lateral anastomosis between the portal and caval systems was performed in 3 Michigan and 1 Alabama hospitals. Of the 65 patients, 57, between the ages of 11 and 70 years, had intrahepatic obstruction, and 8 patients, between the ages of 5 months and 42 years, had extrahepatic obstruction. In 52 of the 57 patients with intrahepatic obstruction, the standard lateral portacaval anastomosis was carried out. When there was portal thrombosis or when there was massive bleeding in the dissection of the portal vein, some variant of the side-to-side anastomosis was carried out. In the presence of caudate lobe hypertrophy it is unwise to resect this lobe and so sacrifice functioning parenchyma or to accept the risk of bile fistula. An acceptable alternative would seem to be the use of the superficial femoral vein as a free graft between the portal vein and the inferior vena cava. This was necessary in only one patient.

Of the 8 patients with extrahepatic obstruction, 5 had the standard lateral portacaval anastomosis, 2 had a side-to-side anastomosis between the superior mesenteric vein and the inferior vena cava, and 1 had an anastomosis between the omental vein and the right renal vein. Five of the 8 patients were children, and because of the small size of the vessels available for anastomosis, the anastomosed vessels did not remain patent after construction of a shunt. Transesophageal ligation is the procedure of choice in infants and young children for the control of bleeding esophageal varices. Repeated ligations may be necessary before the patient reaches the age of 10 years. Transesophageal ligation may also be of value when a previously performed shunt has closed.

In the group with intrahepatic obstruction, there were 11 deaths in the immediate postoperative period. Autopsy was performed on 3 patients, and all had shunts which were patent and free of clot. Nineteen patients died within 41 days to 91 months after the operation. Autopsy was performed on 8; the shunts were patent and free of clot in 6, and in 2 the shunts were closed. There were 8 deaths from hepatic coma in the immediate postoperative period, and coma occurred later in 15 cases. The earlier statement in a previous report that there is less incidence of hepatic coma after lateral portacaval anastomosis must be regarded as erroneous. Hepatic coma is a problem only in patients with cirrhosis. Of the 15 patients with late coma, 9 continued to drink heavily and died in coma without evidence of recurrent esophageal bleeding. The remaining 6

patients abandoned the use of alcohol, responded to treatment for coma, and are living and well. Of the 35 survivors, 31 are gainfully employed or going to school.

There were no deaths in the group with extrahepatic obstruction. Two of these 8 patients have bled again, and 2 of the survivors in the group with intrahepatic obstruction (both with cirrhosis of the liver) had recurrent episodes of bleeding. Two survivors in the group with intrahepatic obstruction are living and well 9 and 10 years postoperatively. Apart from technical considerations, it is impossible to identify a clinical advantage for the lateral portacaval anastomosis. Chronic alcoholism and progressive liver disease cause early demise regardless of the type of shunt performed.

Spontaneous Costal Fracture. F. A. Sanguinetti, J. Spatola and E. A. Mettler. Prensa méd. argent. 46:791-793 (March 27) 1959 (In Spanish) [Buenos Aires].

As a rule, costal fractures are caused by thoracic trauma, either direct or indirect. They immediately produce pain, which increases on palpation. Multiple spontaneous fractures of the ribs are rare, especially in man. They are more frequent on the anterior or lateral surfaces of the lower left ribs, near the cartilages, than at any other location. They do not cause symptoms and are found only during routine examination of the chest. They occur as a result of violent respiration, cough, awkward movements, or during parturition. Secondary factors are pulmonary tuberculosis, pulmonary emphysema or any other pulmonary infection, fragility of the bones from old age, osteoporosis, and diffuse diseases of the bones.

A 62-year-old man was hospitalized in an advanced stage of laryngeal histoplasmosis, pulmonary emphysema, and diffuse osteoporosis. Multiple, bilateral fractures of the posterior surfaces of the 6th, 7th, 8th, and 9th ribs occurred without any symptoms and within an interval of a few days after hospitalization. The fractures were painless, both spontaneously and on palpation, and were detected during a roentgen-ray examination of the chest. Lack of tendency to consolidate was shown both in the roentgenograms and by a biopsy specimen.

Ruptured Abdominal Aortic Aneurysm. J. A. Elliot, A. D. McKenzie and W. B. Chung. Surgery 46:605-617 (Sept.) 1959 [St. Louis].

The authors review observations on 28 patients with ruptured aortic aneurysm, whom they observed from January, 1956, to December, 1958. All the patients had frank ruptures with recent retroperitoneal hemorrhage. Three patients were operated on but died before completion of the procedure; in 4 no surgical therapy was attempted; and in the remaining 21 the aneurysms were resected and replaced by grafts. The majority of the patients on whom resection was performed suffered from serious coincidental disease. Thirteen were in collapse prior to the operation. Nine survived the operation for more than one month. With increase in experience the diagnosis of ruptured aneurysm was made more readily. However, physicians generally seemed to encounter difficulties, since there was considerable delay prior to the diagnosis. Ruptured aneurysm should be added to the differential list of abdominal catastrophes. Immediate operation and aortic control are the most important considerations in treatment; delay invites collapse. Other resuscitative measures have proved to be of incidental importance. The technique of the abdominal operative procedure is described.

Highlights in the experience of these authors were the use of an aortic compressor to obtain proximal control and the piecemeal excision of the aneurysm, with a protective patch left on vulnerable veins. Immediate postoperative complications were impaired leg circulation, oliguria, eviscera-tion, other arteriosclerotic catastrophes, and mechanical obstruction of the small intestine. Two late complications of the replacement procedure were erosion of the proximal anastomosis into the duodenum and fatal gastrointestinal hemorrhage; these occurred at 6 and 33 months respectively. The homograft in the second case showed marked arteriosclerotic degeneration, and this experience as well as the availability of prosthetics, has induced the authors to prefer the latter.

Venous Thromboembolism: A Summary of 10 Years' Experience with 610 Patients and the Evolution of a Routine Management. J. N. Shadid. Surgery 46:588-604 (Sept.) 1959 [St. Louis].

The 3 important interacting factors to consider in thromboembolism are Virchow's triad of vascular damage, slowing of the blood flow, and unknown abnormalities in blood composition. While the amount of vacsular damage and stasis can be clinically estimated, no reliable index of the blood abnormalities was available. In the belief that studies of total physicochemical blood changes might provide an adequate answer, a simple bedside drop test for blood to reflect these changes was devised and applied. The experiences gained with the use of this test on 610 patients with known or suspected venous thromboembolism during the past 10 years indicate that its results, considered in relation to venous damage and blood flow, are trustworthy guides to lead the majority of such patients safely to recovery.

The test consists essentially in timing, under standard conditions of temperature and pressure, the interval taken by 14 drops to fall away from the tip of a standardized and sterilized test instrument

containing 1 ml. of blood drawn directly into it from a vein. This drop-measuring instrument (stactometer) is made up of a 1-ml. tuberculin-type syringe barrel with a 25-gauge, ½-in. hypodermic needle attached. The blood drop time thus obtained is divided by the water drop time standard, which has been previously established for each stactometer by timing its delivery of 14 drops from 1 ml. of distilled water at 25 C. The result is the stactometric ratio (SR) and represents the combined effects of viscosity, surface tension, and specific gravity, which are reflections of the physicochemical state of the blood. Since the rate of blood dropping from the stactometer is dependent on the combined effects of the cellular and plasma elements, a hematocrit determination was performed on the same sample of blood. The test drops and the remainder of the milliliter of blood were caught in a heparinized test tube and used to provide the hematocrit figure. The SR and hematocrit of each subject were recorded on a graph. It was found that the SR line was consistently below the hematocrit line when the subject was in a state of well-being and rose above the hematocrit line when he was under mental or physical stress. This empirical relationship between the SR and hematocrit figures made the hematocrit a convenient base line along which SR fluctuations could be plotted in terms of plus or minus variations.

In all of the 610 patients a presumptive diagnosis of venous thrombosis, pulmonary embolism, or both had been made by referring physicians. Sixty of the patients could not be followed with serial determinations. A routine of management of a patient with suspected or obvious venous thromboembolism is presented. The results of this routine of management in 285 patients are recorded and are compared with the earlier results in 265 patients. It was found that the routine management (*a*) helps dispel much of the doubt from uncertain clinical situations associated with venous thromboembolism, (*b*) more definitely outlines the types and duration of treatment and safely minimizes the period of necessary observation to less than 2 weeks in 90% of the patients and indicates the need for anticoagulant therapy in only 60% of the patients, and (*c*) isolates for concentrated attention those patients requiring prolonged, meticulous treatment and those for whom new treatments should be found.

Spontaneous Hemopneumothorax. P. Bourgeois, G. Rollin and P. Dreyfus. Rev. tuberc. 23:513-532 (May-June) 1959 (In French) [Paris].

Hemopneumothorax, which is produced by the appearance, rarely simultaneous, usually successive, of air and blood in the pleural cavity, has been studied by the authors in the light of 2 cases presented in detail and 286 cases found in the literature. Spontaneous hemopneumothorax is infrequent, estimates of its incidence in relation to the total number of cases of spontaneous pneumothorax ranging from 4 to 12%. It occurs chiefly in men; only 11 cases, or about 4%, have been reported in women. More than 80% of the cases observed occurred in young men between the ages of 17 and 32 years (average, 27 years). The history revealed an occupation involving physical work or habitual participation in sports in most cases. The mortality rate has been variously estimated at from 15 to 25%, but this figure is, in fact, excessive, because, although all fatal cases are presumably reported, many mild ones are probably either not diagnosed or not published. Recovery in nonfatal cases usually takes place without sequelae of any kind within 5 to 8 weeks (3 if the condition is minimal).

Clinical evidence of hemopneumothorax is provided by a combination (with varying time relationships) of the signs of an acute respiratory disease and those of an internal hemorrhage. Spontaneous pain, the major subjective sign, usually marks the onset. It appears suddenly and is generally submammary, but may be felt in the scapular region or even in the lower thorax or below the diaphragm. The frequency of the aberrant localizations of the pain and of its atypical irradiation should be emphasized, because they may lead to serious errors in diagnosis and treatment. Dyspnea, the second essential sign, may be moderate or severe; cough is frequently present, and fever, usually not exceeding 2 degrees above normal, is almost constant. Reflex disturbances, such as nausea and vomiting, may appear, and the patient may even lose consciousness.

The signs of internal hemorrhage may pass unnoticed among the signs of the initial shock, but when they are severe, either at the outset or later on, if the condition develops in 2 stages, emergency thoracotomy may be required. Thoracotomy is also indicated when the hemorrhage persists. It is often advisable to give the patient transfusions of blood before the operation, not to gain time but to restore the blood volume to normal or nearly normal levels. Thoracotomy has many advantages; it makes it possible (1) to secure hemostasis; (2) to make an etiological diagnosis and to suppress the cause of the spontaneous pneumothorax; and (3) to evacuate all clots and thus to promote maximal functional recovery. Hemostasis sometimes occurs spontaneously in less severe cases; consequently, expectant treatment, with thoracocentesis or the insertion of a small intercostal drain for the evacuation of air and blood when the patient is seen at the very beginning of the hemopneumothorax, may be justified. The importance of surgical procedures in the treatment of hemopneumothorax makes immediate referral of patients with this condition to a thoracic surgery center advisable.

PEDIATRICS

Cherubism: Familial Fibrous Dysplasia of the Jaws. N. Thompson. Brit. J. Plast. Surg. 12:89-103 (July) 1959 [Edinburgh].

The author presents the history of a boy with painless, progressive, and disfiguring enlargement of the lower face and jaws. The child showed no abnormalities until he was 2 years old. A photograph taken at the age of 2 years and 5 months showed symmetrical and bilateral swelling of the lower face. This enlargement had continued in gradually progressive fashion throughout the subsequent years. At 5 years of age there was a massive symmetrical enlargement of both maxillae and both sides of the mandible, lending a somewhat pugnacious aspect to the face. The mandible showed on its outer aspect multiple lobulations of 1-to-4-cm. diameter, smooth and ill-defined, bony hard and not tender, and covered intraorally by normal mucosa. Smaller and more discrete lobulations, also smooth and bony hard, were easily palpable on the anterior surface of both maxillae. The alveolus of both jaws was broadened and flattened. The maxillae showed an acutely vaulted, narrow V-shaped, hard palate. The teeth were tilted and in poor occlusion. The submandibular lymph nodes showed bilateral, firm, smooth, nontender, discrete, mobile enlargement of moderate degree.

After describing the roentgenologic aspects and the biopsy specimens taken during the first stage of the operative treatment, the author says that a satisfactory reduction was obtained, but the mandible was inadvertently fractured during the second operation. Great difficulty was encountered in immobilizing the fragments, the often ectopic and deciduous teeth providing an inadequate foundation for splints, and the fibrous nature of the mandible rendering internal fixation impossible. Despite subsequent bone graft, union of the fracture remained fibrous, though function was good. Roentgenography at the age of 8 years revealed that the pathological process continues to progress.

An hereditary factor is involved in this case in that in the boy's maternal grandmother swelling of the lower face had been noticed at the age of 3 to 4 years. This increased steadily throughout her schooldays, but became less noticeable after the age of 20 years. Her condition thereafter steadily improved.

In summarizing previously reported cases of cherubism, the author mentions a report by Jones in 1933 on 3 siblings, aged 6, 5, and 4 years, respectively, who had a bilateral, apparently multilocular cystic disease of both jaws, resulting in marked fulness in the region of the cheeks and jaws, which was enhanced by enlargement of the submandibular lymph nodes. The eyes were described as having "an upward cast," the alveolar ridges were wide, the teeth misplaced or absent. In a subsequent report on this family, when Jones mentioned the peculiar, grotesque, cherubic appearance, he suggested that the term "cherubism" would seem appropriate. Although few subsequent observers have stressed the upturned eyes upon which it was chiefly founded, the pseudonym has persisted.

The boy presented by the author did not have the upturned eyes of cherubism, but a roentgenogram of the chest disclosed peculiar cyst-like changes in the anterior ends of all ribs on both sides. This is the first time involvement of the ribs has been mentioned in this disease. It is assumed that the hereditary element in cherubism arises as a spontaneous mutation of the germ cell. The familial incidence of the disease is the greatest single barrier to explaining cherubism as a fibrous dysplasia of bone, for it does not occur in any other example of the latter. Possibly an inherited predisposition, on which some subsequent factor (traumatic, infective, hormonal) becomes superimposed, may prove an ultimate explanation.

Testosterone-Induced Remission in Aplastic Anemia. N. T. Shahidi and L. K. Diamond. A. M. A. J. Dis. Child. 98:293-302 (Sept.) 1959 [Chicago].

The authors describe a new approach to the therapy of aplastic anemia and the results obtained with it in 5 children, ranging in age from 5 to 15 years; the 1st and 4th patients were male, and the others were female. In addition to corticosteroid therapy and transfusions of platelets, fresh blood, and stored blood as needed, these children were treated with testosterone. The time elapsed between diagnosis and the start of testosterone therapy varied from 6 months to one year in 4 patients, during which they were treated with transfusions and corticosteroids without response. One patient was started on testosterone treatment a few days after the diagnosis was made. Testosterone was used as testosterone propionate or methyltestosterone in the form of 10-mg. buccal Linguets in the dosage of 1 or 2 mg. per kilogram of body weight per day. In addition, one patient was given testosterone enanthate intramuscularly in the dosage of 3 mg. per kilogram of body weight twice weekly. Corticosteroids were administered as triamcinolone, the dosage ranging from 12 to 8 mg. per day.

The bone marrow and peripheral blood studies revealed improvement, beginning with early erythroid regeneration, and beneficial effect of testosterone was also noted on myelopoiesis. Reticulocytosis, with subsequent rise in the hemoglobin level, occurred in all except the 4th child who died. Yet postmortem examination of the bone marrow in the latter patient showed signs of regeneration with erythroid hyperplasia; this was also found in the liver and spleen. Reticulocyte response, however,

did not occur shortly after the institution of therapy, as is often seen in patients with other varieties of anemia given specific therapy. The time lapse between the start of treatment and the occurrence of significant reticulocytosis was 1 or 2 months in the 1st, the 3rd, and the 5th child and was 5 months in the 2nd child. The reticulocytosis was accompanied, or succeeded, in all instances by a rise in the hemoglobin level, so that further transfusions were unnecessary.

Continuation of treatment with testosterone and corticosteroids produced steady increase in the hemoglobin value in all the patients, reaching a peak of 14 Gm. per 100 cc. after 6 months of testosterone therapy in the first child and 3 months in the second. The rise of platelet levels varied greatly in each case. Concomitant with the progress of the bone marrow and peripheral blood changes, the patients showed remarkable clinical improvement. Acne, flushing of the skin, and mild hirsutism occurred in all the patients 2 or 3 months after the institution of testosterone therapy. On one occasion mild papilledema accompanied by headache was noted in the second patient, without any other clinical manifestation. No discrepancy between the chronological age and the bone age was noted at any time. Serum calcium and potassium levels showed no alteration in 2 patients.

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Granuloma Annulare: A Rarely Recognized Disease of Childhood. F. Koch and H. Jantzen. Monatsschr. Kinderh. **107**:364-367 (Aug.) 1959 (In German) [Berlin].

In the course of the last 10 years the authors observed 28 cases of granuloma annulare at the children's clinic of the University in Giessen, Germany. They gained the impression that the disease is becoming more frequent, since 14 of their 28 patients were observed during the last 3 years. They admit that the increase may be only apparent, and that the more frequent diagnosis of the condition may be the result of greater attention to its lesions. In commenting on the terminology, they agree with Dietel, who suggested that the term "granuloma annulare" would be more correct, because the lesions often appear in ring or half-moon groupings. These lesions are most frequent in persons in the first 2 decades, or even the first 15 years, of life; in persons over 40 years of age they are rare.

The onset of granuloma annulare frequently escapes notice, and the lesions are detected accidentally; further search sometimes discloses additional ones. The lesions are whitish, keloid-like, cutaneous nodules, which cause neither pain nor itching. The ring-shaped groupings rarely exceed the size of a silver dollar. Beginning as a pinhead-sized or pea-sized lesion, the infiltration extends peripherally. Later the center sinks down, and here the skin appears atrophic and slightly pigmented. Ulceration does not take place. In addition to the annular foci, there may be disseminated solitary nodules the size of lentils or peas. These, like the annular lesions, are located in the cutis. The epidermis is not involved. The connective tissue in the middle and deeper layers of the corium shows necrobiotic changes.

After a more detailed description of the histopathological aspects of granuloma annulare, the authors discuss the etiology, pointing out that a relationship to rheumatic disorders and a causal connection with tuberculosis have been suggested. The theory that the condition is a specific chronic infectious disease has been largely given up. Although the possible connection with tuberculosis is still being discussed, there is little corroborating evidence for this connection. There are, however, factors that indicate relations to rheumatic disorders, such as the concurrence of granuloma annulare and articular rheumatism, their simultaneous onset after tonsillitis, and the fact that both diseases have the same age distribution. According to some investigators, granuloma annulare belongs to the so-called collagen diseases, which are characterized by allergically induced changes of the collagenous connective tissue. The prognosis of granuloma annulare can be designated as favorable. In view of its tendency to spontaneous cure, the evaluation of therapeutic methods is difficult.

Acute Leukemia with Bone Changes Simulating Calvé-Perthes Disease. E. Mose. Ugesk. laeger **121**: 1224-1226 (Aug. 6) 1959 (In Danish) [Copenhagen].

In acute leukemia of children there are often roentgenologically demonstrable changes in the bones. The changes, which are not specific for leukemia, consist of subperiosteal bony neoformation, osteosclerotic processes, and transverse clarifications in the metaphyses back of the epiphysis line, together with destructive changes, most often in the metaphyses, especially in knee and shoulder joints. The pain in joints and extremities in leukemia is ascribed to the processes in the bones. The pain and certain changes in the bones may appear before definite changes in the blood, especially in aleukemic cases. In a boy, aged 2½ years, with acute leukemia, the changes in the bones in the head of the femur, revealed accidentally on roentgenologic examination occasioned by a trauma, resembled the changes in Calvé-Perthes disease and were at the start the only symptoms of the basic disease. In spite of energetic treatment the blood picture could not be normalized, and the boy died 6 months after the onset of the disease. Autopsy showed no necrosis in the head of the femur or bony neoformation other than that normal for the age. The roentgenologic changes were ascribed to the leukemia.

THERAPEUTICS

Metahexamide Jaundice: Report of a Case. B. Mach, R. A. Field and E. B. Taft. New England J. Med. **261**:438-440 (Aug. 27) 1959 [Boston].

Severe liver damage developed in a woman, 65 years of age, after having received metahexamide, a sulfonylurea, for control of diabetes mellitus. The patient was admitted to the hospital with the main complaint of jaundice of one day duration. Nausea, vomiting, and constipation were present for 3 weeks, and dark urine for 5 days, before the admission. There were no other complaints. A mild variety of diabetes, which had been discovered 5 years before the admission, was adequately controlled, first with insulin, then with tolbutamide, which was, in turn, replaced by metahexamide. Metahexamide had been administered in daily doses of 150 mg. for 3 months before the admission. The course in the hospital was benign, and the diabetes was well regulated on insulin therapy.

The microscopic examination of the liver tissue obtained on aspiration biopsy revealed marked loss of liver cells, particularly about the portal areas, with condensation of stroma and infiltration with moderate numbers of histiocytes, lymphocytes, and rare plasma cells. There was disarray of the lobular pattern of remaining liver cells and occasional rounded eosinophilic masses. Some cells also exhibited ballooning of their cytoplasm. Intracanalicular bile stasis was present, which was not a prominent feature. Mitotic figures were not seen. Since discharge, the patient has remained asymptomatic, and liver-function tests have approached normal values.

Laboratory and histological findings suggest that the lesion in this patient was mainly hepatocellular and resembled that of a severe viral hepatitis or of iproniazid toxicity. Carbutamide, the first sulfonylurea which was clinically experimented with as a hypoglycemic drug, had to be abandoned after the occurrence of several deaths because of hepatic complications. Both metahexamide and carbutamide contain an amino group on the phenyl ring. It seems that the aminophenyl group contributes a strong hepatocellular toxicity to the sulfonylurea agents.

Chlorpropamide in the Management of Diabetes. S. J. N. Sugar, L. J. Thomas and T. M. Eugenio. A. M. A. Arch. Int. Med. **104**:360-364 (Sept.) 1959 [Chicago].

The authors treated 84 patients with diabetes mellitus with chlorpropamide (Diabinese) for periods varying from 2 to 11 months. Of the 84 patients, 37 had been treated previously with insulin or partly controlled with diet, and 47 had received tolbutamide but were not in control. Of the latter group, 10 had failed to respond to tolbutamide within the first month of treatment (primary tolbutamide failures), and 37 had slipped out of control after a variable period of satisfactory management with tolbutamide (secondary tolbutamide failures). A dose of 0.5 Gm. of chlorpropamide per day was selected as starting therapy. After one week, if control was not satisfactory, the dose was increased by increments of 0.25 Gm. Most patients responded to a daily dose of 0.25 to 0.5 Gm. No patients benefited by an increase in the dose to more than 1.5 Gm. Twenty-seven (73%) of the 37 patients previously treated with insulin were adequately managed with chlorpropamide alone. Only 2 of the 10 primary tolbutamide failures responded to chlorpropamide. Twenty-three (62%) of the 37 secondary tolbutamide failures responded to chlorpropamide. Best results were noted in patients over 40 years of age with known duration of diabetes mellitus of less than 10 years, requiring less than 40 units of insulin per day.

Toxicity to chlorpropamide was somewhat related to dosage. Doses of more than 1 Gm. per day were frequently associated with unpleasant side-effects. Gastrointestinal symptoms, chest pain, and muscular weakness were the most prominent side-effects. Occasionally these were relieved by reduction in the dose of the drug. Chlorpropamide is more potent than tolbutamide in blood-sugar-lowering ability. Unstable diabetics of any age are poor candidates for control with chlorpropamide.

Chlorpropamide Therapy of Diabetes: An Appraisal. R. C. Stewart, E. U. Piazza, H. Hyman III and D. Hurwitz. New England J. Med. **261**:427-430 (Aug. 27) 1959 [Boston].

Chlorpropamide was administered orally for 3 months to 56 outpatients with diabetes mellitus. The initial daily dosage of 1 Gm. of chlorpropamide produced hypoglycemia and side-effects in several patients. These symptoms were less frequent when the daily dose level was subsequently decreased to 500 mg. Six patients were eliminated because they were lost to follow-up study. The drug had to be withdrawn in 12 patients—in 8 because of poor control and in 4 because of severe side-effects. These side-effects were excessive salivation, nausea, and anorexia in one, jaundice (obstructive type) in one, generalized erythema multiforme accompanied by fever and eosinophilia in one, and vertigo and fatigue in one. The only laboratory test that showed abnormality during the study was the alkaline phosphatase.

Of 38 patients who completed the therapy, excellent results were obtained in 19, good in 8, fair in 8, and poor in 3. The duration of diabetes was less than 10 years in 36 patients and more than 10 years in 14. Diabetes of less than 10 years' duration was adequately controlled with chlorpropamide in 23 patients (64%), whereas in instances of more than

10 years' duration it was adequately controlled in 7 (50%). Twenty-seven patients had previously received tolbutamide. Three patients had better control on tolbutamide, and 16 on chlorpropamide; 8 had the same control on either drug. The more prolonged action of chlorpropamide was an advantage over tolbutamide.

Thirty-four patients who had previously taken insulin were suddenly withdrawn from insulin and transferred to the amount of chlorpropamide necessary for maximal control. Thirteen patients had better control on chlorpropamide, and 13 on insulin; 8 had the same control on either drug. Although more patients had adequate control on insulin than on chlorpropamide, excellent control was obtained in more patients (13) who received chlorpropamide than in those (4) who received insulin. This comparison suggests that chlorpropamide, when effective, may provide more prolonged and constant control than intermediate-acting insulin. This study is based on short-term observations.

Mannomustine in Treatment of Leukemias, Polycythemia, and Malignant Disorders. A. M. Barlow, J. T. Leeming and J. F. Wilkinson. Brit. M. J. 2:208-213 (Aug. 22) 1959 [London].

A new cytostatic compound, mannomustine, has been used in the treatment of 45 patients with leukemias, polycythemia, reticulosis, and malignant disease. Since the administration of doses as high as 200 to 500 mg. of mannomustine in one injection proved to produce frequent and severe toxic reactions, the maximal single dose was restricted to 100 mg. daily or on alternate days, and this was found to be the most satisfactory dosage scheme. The required total dosage varied from patient to patient and with the particular disease.

In only 2 of 12 patients with myeloid leukemia was a favorable response to mannomustine therapy observed; however, both patients relapsed shortly. In the remaining 10 patients control was inadequate and of short duration. The responses to further courses of mannomustine given to 6 patients were even less satisfactory than those after the initial courses. A considerable variation in response could be seen in 3 patients with chronic lymphocytic leukemia. Mannomustine therapy proved to be of some value in the treatment of 6 patients with acute leukemia, in whom the initial white blood cell counts were high. The total white blood cell count was reduced to relatively normal levels, facilitating the subsequent action of prednisolone and blood transfusions. In none of these patients was complete remission obtained.

Mannomustine appears to be of some value in the treatment of reticulosis, follicular lymphoreticulosis, reticulosarcoma, multiple myeloma, and polycythemia. In 5 of 14 patients with reticulosis, good responses were observed, while they were moderately good in 4. However, the responses were not as good as those achieved with tri(2-chloroethyl)-amine hydrochloride (Trillekamin); many more injections were required with mannomustine, and these injections produced more toxic effects, generally and on the bone marrow, than those obtained with Trillekamin. Mannomustine would appear to be more effective than triethylenethiophosphoramide (Thio-Tepa) in patients with reticulosis, as complete regressions of hepatomegaly, splenomegaly, and mediastinal lymphadenopathy have been obtained in most cases in this series, whereas Thio-Tepa has been relatively inactive in reticulosis involving these structures. Two patients with follicular lymphoreticulosis and one with reticulosarcoma benefited from treatment, and one patient with multiple myeloma showed such good symptomatic and objective improvement that further treatment with mannomustine, alone or in combination with urethane, was advisable. Mannomustine was of little value in 5 patients with carcinoma. In 2 of these patients severe anemia and thrombocytopenia developed, which may well have contributed in some degree to their more rapid deterioration. Satisfactory remissions were obtained in 4 patients with polycythemia.

Toxic effects of mannomustine therapy can be severe, particularly on the bone marrow and especially if a second course has been given within 4 months. Gastrointestinal side-effects, nausea, or vomiting occurred in 42% of the patients after single doses of 1.5 to 2 mg. per kilogram; as high as 70% were affected after doses of 3 to 7 mg. per kilogram.

The Present Status of the Clinical Evaluation of Fibrinolysin. R. V. Chapple and H. O. Singher. Canad. M. A. J. 81:231-234 (Aug. 15) 1959 [Toronto].

The authors report on 322 patients with thromboembolic disease, who were treated with a preparation of human fibrinolysin in some of the larger hospitals in Boston, New York, Washington, and Philadelphia. Alteration in the coagulation mechanism or hemorrhagic complications did not occur in any of the patients. The concomitant use of anticoagulants, either heparin or one of the coumarin types, did not produce any deleterious effects. Doses between 50,000 and 100,000 units of fibrinolysin were significantly more effective than doses below 50,000 units. Fibrin clots are usually well organized within 5 to 7 days after their formation. This organization retards the lytic action of fibrinolysin. In view of this limitation of lytic activity, the maximum therapeutic response in patients with phlebothrombosis was obtained in recently formed clots. Excellent results with a return of limb measurement to normal within 48 to 72 hours were obtained in 57 (83%) of 69 patients with phlebothrom-

bosis, who were treated with fibrinolysin within 3 to 5 days after clot formation. Of 63 patients treated with fibrinolysin when their clots had been present for more than 5 days, an excellent response was obtained in only 39 (62%).

Pulmonary embolism is primarily based on the fragmentation of an existing thrombus. Pulmonary embolism appeared concomitantly in 3 of 172 patients on fibrinolysin therapy for phlebothrombosis. With the maintenance of an adequate systemic fibrinolytic level, no sequelae occurred. This incidence of pulmonary embolism was possibly less than the usual occurrence of pulmonary emboli. The only major side-reaction observed with fibrinolysin therapy was a temperature response varying from mild (below 102 F [38.5 C]) to severe (over 102 F). Only 29% of the 322 patients fell into this latter category. An urticarial type of reaction occurred in less than 1% of the patients. Some nausea and/or vomiting occurred in those patients with an exceedingly high temperature response.

At present fibrinolysin appears very promising in patients with thromboembolic disease. Fibrinolysin must not be considered as an anticoagulant. It is a lytic agent and will immediately lyse a forming clot owing to its affinity for fibrin. It proved therapeutically effective in patients with phlebothrombosis, thrombophlebitis, and pulmonary embolism when used appropriately. It is apparent that fibrinolysin, as now produced and used in a dosage ranging from 25,000 to 250,000 units, is therapeutically acceptable from a clinical pharmacological viewpoint. Large-scale statistical studies will alone determine its effectiveness in some of the many therapeutic indications. There has been no significant relation between the potency of fibrinolysin and the presence or absence of concomitant anticoagulant therapy. It is, however, important to consider ambulatory anticoagulant therapy after fibrinolysin administration to prevent the formation of further thrombi. While the offending thrombus is lysed, the associated intimal damage usually requires a longer period for complete epithelization.

RADIOLOGY

Contribution to the Roentgen-ray Picture of Pulmonary Aspergillosis. H. Voigt and A. Krebs. Beitr. Klin. Tuberk. 120:331-340 (no. 5) 1959 (In German) [Berlin].

The authors report the roentgenologic findings in 2 men, aged 27 and 40 years, a 22-year-old woman, a 14-year-old girl, and a 16-year-old boy, who underwent lobectomy or segmental pulmonary resection for cavitary disease of the upper lobe associated with repeated hemoptysis. Bacteriological-mycological examination of the surgical specimens revealed the presence of Aspergillus fumigatus in all 5 patients. The chest roentgenograms and particularly the tomograms of the 27-year-old man and of the girl showed the characteristic shadow of aspergillosis, i. e., a rounded density with a radiolucent cap. The chest roentgenograms of the other 3 patients were not characteristic. In the 40-year-old man, the fungus had settled in a cavity of questionable origin, and the tomogram showed a cavity with mirror formation and a dilated draining bronchus. The tomogram of the boy showed a cavity with calcium deposits. The roentgenogram and the tomogram of the woman showed a shadow the size of a palm in the cardiac-diaphragmatic angle which decreased in density upward. In the last 2 patients, examination of the surgical specimen revealed A. fumigatus in bronchiectatic cavities which no longer showed a communication with the bronchial tree. The authors believe that, even in the presence of uncharacteristic roentgenologic findings, the uniform clinical symptomatology, particularly hemoptysis, and the repeated occurrence of bronchitis or bronchopneumonia in the absence of Mycobacterium tuberculosis should be considered suggestive of a fungus disease of the lung, particularly in young patients.

PUBLIC HEALTH

Paralytic Poliomyelitis Trends, Canada, 1958. D. Kubryk. Canad. M. A. J. 81:228-231 (Aug. 15) 1959 [Toronto].

In 1958, for the first time in 6 years since the advent of the Salk vaccine, reported cases of paralytic poliomyelitis in Canada increased sharply under the impact of an epidemic in the province of Manitoba that accounted for 107 (42%) of the total of 253 cases, and a lesser outbreak in the province of Quebec with 79 cases, accounting for 31% of the total number. The number of paralytic cases of poliomyelitis was 43% higher than in 1957. Most of these cases occurred among unvaccinated persons, and in the province of Quebec particularly among children of preschool age. It seems that the adult population of the province of Quebec possesses a higher degree of naturally acquired immunity than that of the other provinces in which the number of adults and of preschool children involved in the epidemic was about the same. In the preschool age group the highest attack rates were between the ages of 1 and 3 years, the peak having shifted from the 2-year-olds in 1957 to the 1-year-olds in 1958. The attack rate in the 1-year-olds and those aged less than 1 year was about 3 times higher in 1958 than in 1957. The efficacy of vaccination was proved again. Most of the patients who stated that they had been vaccinated had in reality received only 1 or 2 injections. Twenty-nine deaths occurred

among the 253 patients, a mortality rate of 11.4% as compared with that of 14.7% in 1957. Most of these deaths occurred among adults.

If the repetition of the 1958 outbreak is to be avoided, it is imperative that the drive for vaccination receive the fullest kind of backing. Now that the school age group is fairly well protected, the same protection should be extended to the preschool age group, in which most of the cases occur, and to adults, in whom most of the deaths have occurred. Among the adults, the 25-34 age group should receive special attention; these are the young parents who may be infected by their vaccinated children acting as symptomless carriers.

A Comparison of the Responses of 100 Infants to Primary Poliomyelitis Immunization with Two and with Three Doses of Vaccine. F. T. Perkins, R. Yetts and W. Gaisford. Brit. M. J. 1:1083-1086 (April 25) 1959 [London].

Previous investigations revealed that in only a small proportion of infants, under the age of 10 weeks, could a satisfactory basal immunity be established by the injection of 2 doses of poliomyelitis vaccine. This prompted the authors to study the response to 2 and 3 doses of the vaccine in 45 1-week-old infants and in 55 16-week-old infants. Of the 45 1-week-old infants, 36 received 3 doses, and 9 received only 1 dose. The vaccine was given at intervals of 4 weeks, and all infants were 1 week old at the time they received the first shot. Each dose contained 2 ml. of the vaccine and was given by injecting 1 ml. into each buttock. The total volume was thus 4 ml. for those who received 2 doses and 6 ml. for those who received 3. All the 55 16-week-old infants were given 3 doses of vaccine intramuscularly, each of 1 ml. spaced at intervals of 4 weeks. All were 15 to 17 weeks of age at the time they received the first dose.

It is evident from the results with the 1-week-old infants that the responses to 2 doses, each of 2 ml., were no better than the responses obtained previously in a similar group of infants who were given 2 doses, each of 1 ml. The response to 3 doses, 2 ml. each, was somewhat better, but there was a high proportion of nonresponders to all 3 types. The responses to 2 doses of the vaccine, 1 ml. each, in the 16-week-old infants who had little or no maternal antibody were no better than those obtained in a previous study with 10-week-old infants on a similar schedule. Three doses, however, gave a decided improvement; 83% of the infants responded to type 1, and all the infants responded to types 2 and 3.

The geometric mean antibody titers reflected the greater immunizing power of the 3-dose schedule. Although a high proportion of infants with no maternal antibody responded to immunization, less satisfactory results were obtained with those who had maternal antibody. After 2 doses, only 11% responded to type 1, 39% to type 2, and 52% to type 3, and after 3 doses the corresponding figures were 36, 62, and 91%. It is thus evident that the 3-dose schedule was unable in all cases to overcome the maternal antibody interference, especially with type 1. In order to obtain satisfactory immunization to all types in all infants, it is suggested that immunization should be delayed until 6 to 9 months of age, at which time 3 doses of vaccine should be considered as a course of primary immunization.

Results of a Study of the Reactogenic and Immunogenic Properties of Live Anti-Poliomyelitis Vaccine. A. A. Smorodintsev, E. F. Davidenkova, A. I. Drobyshevskaya and others. Bull. World Health Organ. 20:1053-1074 (no. 6) 1959 (In English) [Geneva].

The authors studied the reactogenic and immunogenic properties of live poliomyelitis vaccine made in Leningrad from Sabin strains of low pathogenicity for monkeys. More than 20,000 children of preschool age (6 months to 3 years) and of school age (7 to 14 years) were each given 100,000 tissue-culture infective doses of virus of types 1, 2, and 3, injected either in 3 stages at monthly intervals in the form of monovaccines, or in 2 stages, a monovaccine of type 1 being followed after a month's interval by injection of a divalent vaccine of types 2 and 3. The vaccination caused no symptoms of lesions of the central nervous system or other organs. In the blood of the inoculated children there was a regular build-up of virus-neutralizing antibodies to the serotypes mentioned, the intensity of which depended on the antibody level before vaccination and was in a constant relationship to the multiplication of the virus in the intestinal canal. The antibody titer was maintained at high levels for 6 to 9 months after immunization and fell a little after 12 to 18 months. The vaccinal virus is easily transferred from vaccinated children to contact groups, which are gradually vaccinated by this natural means.

Lengthy and numerous passages of vaccinal strains through the intestinal canal of normal, susceptible children showed that strains may periodically appear which have a higher neurotropic activity for monkeys. This activity, however, did not increase in subsequent passage and returned to the initial level. Results of this study show the harmlessness and high level of immunogenicity of Sabin's live vaccine for the groups of children most susceptible to poliomyelitis and provide a basis for the further study of this important method in larger-scale epidemiologic experiments.

BOOK REVIEWS

Hernia. By Sir Heneage Ogilvie, K.B.E., M. A., M.Ch. Cloth. $6.50. Pp. 135, with 51 illustrations. Williams & Wilkins Company, 428 E. Preston St., Baltimore 2; Edward Arnold (Publishers) Ltd., 41-43 Maddox St., London, W. 1, England, 1959.

There is a place in the extensive literature on hernia for a thin volume containing the distillate of a mature surgeon's thoughts on this important subject. In a field where types of operations are as numerous as surgeons performing them, a dogmatic approach based on more than three decades of experience and careful observation is welcome. Many surgeons, especially in America, will take issue with some of the author's views, but there are few who will disagree with his insistence on strict adherence to the traditional principles of hernia repair.

The book is well written, and the information is presented in a clear manner. The first chapter concerns the place of apparatus in the treatment of hernia. The second chapter, the best section in the volume, deals with the general principles in the operative repair of hernia and presents many personal views. These are the result of the author's experiences with a variety of techniques and materials. They are his opinions, he states them frankly, and he justifies them. He does not hedge, and, to use his own word, he is not obsequious. He prefers small catgut but comments on various other suture materials. He talks of needles, describes silver wire filigree, remarks on sheets of fascia, derma, and nylon, and ends with a note on tantalum. In succeeding chapters he refers to points made earlier and amplifies them. Fascial strips as introduced by Gallie and le Mesurier are considered unsuitable for the repair of inguinal hernias.

A discussion of inguinal hernia occupies the major part of the space in this book, as it should. The anatomy and function of the various structures in the inguinal region are presented as this surgeon sees them in the living subject. The author then discusses the forces and changes leading to the development of inguinal hernia and proceeds to the general principles of operations on the inguinal canal. Local anesthesia is favored in many instances and is described more fully than in most textbooks. The author's standard operations for three degrees of increasing pathological change found in inguinal hernias are well described and are the rational repair methods adopted after long experience. The management of interstitial, congenital direct, sliding, large, and recurrent hernias; the problem of the undescended testis; and operations for inguinal hernia in infants are described. The chapter on standard operations that are not recommended for inguinal hernias makes interesting reading. Specifically, the author does not like Bassini's operation, Gallie's fascial repair, the McVay principle, Halsted's anterior reconstruction, and others; he gives reasons for his stand. The reader may not concur with all the author's ideas, but he is forced to think again about operations he may have been performing without question.

The presentations on femoral, umbilical, epigastric, incisional, and the rarer spigelian and pelvic hernias are excellent and include first-rate simple illustrations which would in themselves make this small volume worthwhile. Books of this sort are not common. One is usually offered the gamut of operations with no comment as to why the author would use some and not others. The author, from a lifetime of experience, flatly states his views on hernias, which are a subject of continued concern to the active general surgeon. This small personal volume should be a welcome addition to the latter's collection as well as to the libraries of all institutions engaged in the training of surgeons.

Mycoses of Man and Animals. By R. Vanbreuseghem, M.D., Professeur de Parasitologie tropicale à l'Université libre de Bruxelles. Authorized English translation by J. Wilkinson, Ph.D., F.L.S. Cloth. $10.50. Pp. 235, with 48 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Sir Isaac Pitman & Sons, Ltd., Pitman House, Parker St., Kingsway, London, W. C. 2, England, 1958.

Dermatologists and medical and veterinary mycologists should welcome this textbook, which is an English translation of the third part of Dr. Maurice Langeron's admirable "Précis de Mycologie." The book hardly provides material for adverse criticism. The author has expressed his modesty in the following quotation from Terrence: "Since that which you wish cannot happen, you should desire what can happen." Indeed, more is offered in this volume than the modesty expressed in this motto would lead one to anticipate. The book presents a profound study of the common superficial and systemic mycoses, arranged in alphabetical order. A particular feature is that each disease is introduced by a brief review of outstanding historical facts. There follows a discussion of pertinent mycological, clinical, immunological, experimental, and therapeutic data, presented in a clear and concise style. The chapter dealing with dermatophytes raises several controversial issues in relation to classification, but this should not diminish the textbook's real value. The book was apparently in print before the introduction of nystatin, amphotericin B, and griseofulvin, as no mention is made of these important therapeutic advances. More illustrations and a better index would be desirable. The bibliography is adequate. This English translation should receive the same enthusiastic reception as the original French edition.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

QUESTIONS AND ANSWERS

HYPERIMMUNE VACCINAL GAMMA GLOBULIN

TO THE EDITOR:—*A recent newspaper story told of a rare serum that was rushed from Colorado to Maine to aid in the care of a boy afflicted with eczema vaccinatum. What are the disease and treatment referred to?* *M.D., South Carolina.*

ANSWER.—Eczema vaccinatum is an occasional complication of smallpox vaccination. The child who is a likely candidate for the illness has usually not been vaccinated, because of a skin condition, and is exposed to the vaccine through a vaccinated sibling. Eczema vaccinatum in children 4 years of age or less is a life-threatening disease because of the massive nature of virus involvement. In addition to the spread of the infection from the initial contact site to all other eczematous skin areas, including those which may have minimal involvement with eczema, viremia frequently is a complication, as evidenced by the lesions that occur on normal skin. Serologic studies indicate that these patients have a delay in antibody production, and, for many of them, this delay is for the vaccinia virus only. This may be due to the relative immaturity of the patient, or it may denote the overwhelming nature of the antigenic stimulation and mean that any neutralizing antibodies produced are quickly tied up by the virus present and cannot be measured.

Although the total gamma globulin levels may be high in children suffering from eczema, antibody levels to vaccinia virus, during and after a serious infection with vaccinia contracted by accident, may be surprisingly low. No controlled experiments are available because of the serious nature of the disease. It is this consultant's opinion that the administration of hyperimmune vaccinal gamma globulin obtained from recently vaccinated young adults decreases toxemia, limits the spread of the virus, and influences the course favorably. The dose is 0.3 to 0.5 cc. per kilogram of body weight given once intramuscularly, but it may be repeated if the patient does not improve in 24 hours. The material is available through the American Red Cross and from the University of Colorado Medical Center, Denver. Hyperimmune vaccinal gamma globulin has been successfully used in the treatment of a child with generalized vaccinia (without eczema) and vaccinia necrosum (progressive vaccinia). The latter is characterized by complete immunological paralysis and steady progression of virus infection leading to death, unless massive amounts of antibodies and other emergency measures are provided.

Hyperimmune vaccinal gamma globulin will soon be licensed and removed from the experimental designation it now carries. Experience with its use in serious complications of smallpox vaccination is such that its administration as a therapeutic or prophylactic agent should be further evaluated.

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Peirce, E. R.; Melville, F. S.; Downie, A. W.; and Duckworth, M.: Antivaccinial Gamma-globulin in Smallpox Prophylaxis, Lancet **2**:635-638 (Sept. 20) 1958.

EMOTIONAL ILLNESS

TO THE EDITOR:—*A 29-year-old farmer, who has not had previous emotional difficulties, complains of excessive concern about his crops, his financial status, and other problems. Because of this he is unable to do his work. Examination revealed severe depression, intermittent hypertension, with blood pressures up to 160/96 mm. Hg, a protein-bound iodine level of 2.6 mcg. per 100 ml., and a urinary 17-ketosteroid excretion of 36 mg. per day. A repeated measurement of the 17-ketosteroid excretion, after all medication was stopped, was 29 mg. per day. ACTH was given for three days. The 17-ketosteroid excretion was 39 mg. on the second day and 42 mg. on the third. The patient went to another hospital two weeks later and at this time seemed much improved. His attending physician was not impressed by the emotional aspect of his difficulties. He returned home and the depression recurred. Psychiatric consultation was obtained and the patient had an excellent response to shock therapy. What is the management of this patient from this point on?*

Clarence E. Hicks, M.D., Hereford, Texas.

ANSWER.—Before deciding which course to pursue, one must appraise the patient's symptoms and the laboratory findings. The clinical findings are those of an acute emotional depression in a young man, and there is evidence of autonomic imbalance with endocrine involvement. It is significant that the depression disappeared when the patient left home but recurred on his return. The depression was relieved after convulsive shock therapy. It is assumed, since no statement is made about the

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

laboratory findings after electric shock therapy, that they were normal. This may be a simple depression or the depression may be a symptom of a basic incipient schizophrenic psychosis. It is not uncommon to find electrolytic, hormonal, and metabolic disturbances in either case, since emotional stress is known to cause changes in adrenal and thyroid gland activity, the excretion of epinephrine and arterenol, and the excretion of electrolytes. The patient's condition needs further study, with emphasis on psychiatric evaluation and treatment rather than biochemical tests.

TIME OF SERVING MAIN MEAL

To the Editor:—*The amount of fat in the blood is known to increase after a meal and to reach a maximum six hours later. This nutritional lipemia or hyperlipemia increases the blood coagulability, and, since rest and not physical stress predisposes to coronary and cerebral thrombotic accidents, would it be wiser to have the main (richer in fat) meal at noon than in the evening?*

Herman Schauder, M.D., New York.

Answer.—There is no simple answer to this question, since many factors are involved. That hyperlipemia increases coagulability is questionable. Several observers report no change in coagulability after meals high in fat content and an equal number have found an increased tendency for clot formation. None of the present tests of coagulation is perfect. While rest and stasis may predispose to thrombosis formation, physical activity performed just after a meal may be dangerous for the person with narrowed coronary arteries. Patients frequently relate that anginal pain is most easily brought on by walking after meals. Shifting the main meal to lunch time would accomplish little, unless the custom of a siesta after lunch were to be instituted at the same time. It would seem best to reduce the saturated (animal) fat portion of the meals for persons who have elevated serum lipid levels.

MANAGEMENT OF ADYNAMIC ILEUS

To the Editor:—*What drug can be used to treat a patient with adynamic ileus? What is the effect of d-pantothenyl alcohol (Ilopan) in postoperative ileus?*

Lloyd H. Murdock, M.D., Zwolle, La.

Answer.—Reflex ileus occurring postoperatively may be due to the cumulative effects of anesthesia, surgical trauma, and narcotics. Morphine, methscopolamine, or hexamethonium in repeated large doses can produce ileus. Management includes nasogastric intubation, use of the rectal tube, cholinergic medication (neostigmine or lethanechol), restoration of fluid balance, chemotherapy, and general supportive measures. The preliminary reports on d-pantothenyl alcohol are favorable, but further experience with this drug is warranted. The pantothenic acid component is part of coenzyme A which is essential to the acetylation of choline. Acetylcholine, the physiological transmitter of nerve impulses at various levels of the autonomic nervous system, is required for normal peristaltic intestinal activity. There is little risk of overproduction of acetylcholine by excessive administration of d-pantothenyl alcohol, since the tissue will produce only the amount of acetylcholine it needs and thus excessive cholinergic reactions will be avoided. In fact, the concomitant administration of d-pantothenyl alcohol with cholinesterase inhibitors (such as neostigmine) is contraindicated.

TREATMENT OF SNAKE BITE

To the Editor:—*In* The Journal, *Feb. 14, page 782, it was stated that the coral snake antivenin from Florida is made from cobra venom. There is, in central Florida, a source of true coral snake antivenin which is made in South America and available at the following hospitals in Florida: Morrell Memorial Hospital, Lakeland; Winter Haven Hospital, Winter Haven; Jackson Memorial Hospital, Dade City; and South Florida Baptist Hospital, Plant City.*

The gathering of this information was done by Mr. R. E. Lewis, manager of the Lakeland Surgical Supply, Incorporated.

Although it is true that coral snake bites are not a major problem in Florida, the information is worth passing on to your readers.

F. Layton Bergquist, M.D.
119 Allamanda Dr.
Lakeland, Fla.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*I was not aware of the availability in central Florida of true coral snake antivenin until I too received a letter from Mr. R. E. Lewis. The information is correct. The availability of true coral snake antivenin is not widely known in Florida and even less well-known outside Florida. This information should be of interest to physicians in the southwest, where the Sonoran coral snake (Micrurus euryxanthus) threat is similar to that of the Eastern coral snake (Micrurus fulvius, harlequin snake) in Florida. Although it has been repeatedly stated that coral snake bites in the human are not a major problem (in Florida or elsewhere), to the person who has been bitten by a coral snake it is a major problem indeed.*

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JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, SEPTEMBER-DECEMBER 1959

Abstracts have been made of important articles in the following journals in the Current Medical Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by the Library of the American Medical Association to individuals in Continental United States and Canada who subscribe to its scientific periodicals and to members of the American Medical Association and its student organization. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each periodical. Three journals may be borrowed at a time for a period not exceeding five days. Thus most of these journals are accessible to the general practitioner.

*A. M. A. Archives of Dermatology. Chicago.
*A. M. A. Archives of General Psychiatry. Chicago.
*A. M. A. Archives of Industrial Health. Chicago.
*A. M. A. Archives of Internal Medicine. Chicago.
*A. M. A. Archives of Neurology. Chicago.
*A. M. A. Archives of Neurology and Psychiatry. Chicago.
*A. M. A. Archives of Ophthalmology. Chicago.
*A. M. A. Archives of Otolaryngology. Chicago.
*A. M. A. Archives of Pathology. Chicago.
*A. M. A. Archives of Surgery. Chicago.
*A. M. A. Journal of Diseases of Children. Chicago.
Acta chirurgica belgica. Brussels.
Acta chirurgica italica. Padua.
Acta chirurgica scandinavica. Stockholm.
Acta clinica belgica. Brussels.
Acta endocrinologica. Copenhagen.
Acta gastro-enterologica belgica. Brussels.
Acta haematologica. Basel.
Acta medica italica di malattie infettive e parassitarie. Rome.
Acta medica scandinavica. Stockholm.
Acta paediatrica belgica. Brussels.
Acta paediatrica. Uppsala.
American Heart Journal. St. Louis.
American Journal of Cardiology. New York.
American Journal of Digestive Diseases. New York.
American Journal of Gastroenterology. New York.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Medicine. New York.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Chicago.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Tropical Medicine and Hygiene. Baltimore.
American Review of Tuberculosis. New York.
American Surgeon. Baltimore.
Anales de cirurgia. Rosario.
Anales de la Facultad de Medicina. Lima.
Anesthesiology. Philadelphia.
Annali medici di Somdalo. Sondrio.
Annals of Allergy. St. Paul.
Annals of Internal Medicine. Lancaster, Pa.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Archiv für klinische Chirurgie. Berlin.
Archives françaises de pédiatrie. Paris.
Archivio italiano di chirurgia. Bologna.
Archivio italiano di pediatria e puericoltura. Bologna.
Archivos del Instituto de cardiologia de México. México, D. F.
Archivum chirurgicum neerlandicum. Arnhem.
Arquivo de patologia. Lisbon.
Arthritis and Rheumatism. New York.
Australasian Annals of Medicine. Sydney.
Beiträge zur Klinik der Tuberkulose. Berlin.
Beitrage zur klinischen Chirurgie. Munich.
Blood. New York.
Blut. Munich.
Boletin de la Asociación médica de Puerto Rico. Santurce.
British Heart Journal. London.
British Journal of Diseases of the Chest. London.
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*Cannot be lent.

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The letters used to explain in which department the matter indexed appears are as follows: "E," Editorial; "C," Correspondence; "ab," abstracts; the asterisk (*) indicates an original article in THE JOURNAL. Page numbers in the index refer to the bold face numbers in the text.

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Acad.—Academy
Am.—American
A.—Association
Coll.—College
Commn.—Commission
Comm.—Committee
Conf.—Conference
Cong.—Congress
Dist.—District
Div.—Division
Found.—Foundation
Hosp.—Hospital
Indust.—Industrial
Inst.—Institute
Internat.—International
M.—Medical
Med.—Medicine
Nat.—National
Pharm.—Pharmaceutical
Phys.—Physicians
Soc.—Society
Surg.—Surgery
Surgs.—Surgeons
S.—Surgical

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